Telephony.

THE AMERICAN TELEPHONE JOURNAL

Comprising Telephony, American Telephone Journal, Telephone Weekly, Telephone Magazine, Telephone Securities, The Telephone and Sound Waves
PUBLISHED WEEKLY BY THE TELEPHONY PUBLISHING COMPANY, MONADNOCK BLOCK, CHICAGO

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CHICAGO, NOVEMBER 9, 1912

SINGLE COPIES, 10 CENTS
YEARLY, U. S. A., $3; CANADA, $4;
ALL OTHER COUNTRIES, $5

A Protective Leather Work Glove for the Lineman

For years—ever since electricity has been commercialized—there has been an insistent desire for a leather work glove that would have superior durability and also a greater degree of resistance to electric currents.

For years we have been studying, experimenting, working to make such a glove.

And now the work is done. The process of treating the leather gives insulating properties and we are producing **Rezistol** leather work gloves in which the lineman can more safely handle "live" wires than he can with any other kind of leather glove.

A well-known electrical engineer doubted our claims. "Take the leather," we said, "and test it. Put it through the most severe ordeal you can give it. We are more anxious than you are to know just how much it will stand."

He subjected the leather to a high voltage "breakdown" test and it did not puncture under 4,000 volts.

Grinnell REZISTOL (Trade-Mark) **Gloves**

They are soft and pliable. They save the hands and prevent skin abrasion. They are easy to work with. They let the wearer get a a good "grip."

They will not harden, crack or peel from wetting, bending, creasing or changes of temperature. Clean them with soap and water or with gasoline and they resume their new appearance.

Never before has any wearing material except rubber shown such a high degree of resistance. But rubber is not a desirable material for work gloves. It can't "stand the gaff"—it will not give the service that leather gives.

Rezistol is what we call this leather and it is also what we have called the gloves. From now on gloves with this name on them should be in every lineman's and electrician's outfit.

But **Rezistol** Gloves give more than this protection against electricity—important as that may be. They give comfort and service.

They will outlast two or three pairs of ordinary gloves and are, therefore the least expensive. The big element of safety given by **Rezistol** costs nothing.

No lineman or other electrical worker should henceforth consider the purchase of the ordinary leather glove.

In **Rezistol** Gloves he obtains the service, the comfort and the economy he wants and also obtains the safety found in the resistance which this new leather presents to electricity.

A pair of Rezistol Gloves *FREE*

If your dealer does not have these gloves send us his name. With his first order for our 4-dozen trial assortment we will send a pair FREE for you

ESTABLISHED 1856

A WORD TO MANAGERS Because **Rezistol** Gloves are really the least expensive and because they also have such desirable protective qualities, you should advise every man in your employ to wear them. If your local dealers do not carry them, they will put these gloves in stock if you and your employes request them to do so.

Send for our descriptive circular and for samples of leather which you yourself can test.

MORRISON-RICKER MFG. CO. 133 Broad St., GRINNELL, IA.

Kelly said, "Send me"

He was anxious for his company to send him to close a certain account. He knew that regardless of competition, his product had superior merit. He was confident he'd land the order if sent—which he did.

We're going to feel like Kelly did—that we are going to secure your Terminal and Junction Box business, if we can get you reading our advertisements.

Considering the years of experience our engineers have had, and the many improvements we've made, we believe

MOON TERMINALS and JUNCTION BOXES

are the superior of any.

We'd like to mail you a copy of our new catalogue. You'll find it meaty reading.

MOON MFG. CO.
120 N. Jefferson St.
Chicago, Ill.

TELEPHONE WIRE

We Guarantee
Greatest Efficiency
Longest Life
Most Satisfactory Service
Lowest Cost of Up-keep
In the Use of our wire.

Write for FREE SAMPLE
Make Test and Comparison

Approved by Leading Institutions of Technology and Telephonic Science. Handled by most representative Jobbers and Supply Houses.

Indiana Steel & Wire Co.
Muncie, Indiana.

KLEIN TOOLS EST 1857

Many little customers of years ago, are Klein's biggest customers today

EVERY once in a while, we go back over our records and find out what's doing. And it's a rather significant fact that many of our little customers of years ago are the largest purchasers of Klein's linemen tools today. They early recognized that quality played a dominant part in Klein tools; that quality made reliability possible in Klein tools; so that once they started to use Klein tools they continued the practice, economy told them it was the best thing to do. Savings made here and there permit a company to grow. A trial order will fully convince you Klein tools are the best.

Mathias Klein & Sons
Station U 34
Chicago, Illinois

The Peirce Cow Horn Break Arm Bracket

Sometimes called a "jumping-off" bracket

The purpose of this bracket is to lead a wire from one end of a cross arm to the other end and then to a toll station or subscriber's premises. Can be fastened o either the end of the arm or between two pins.

Two weights for long or ordinary spars furnished complete with bolts ready to install.

Order of your jobber—if he can not supply you write us

HUBBARD & CO.
PITTSBURGH
NEW YORK CHICAGO

Telephony.

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CHICAGO, SATURDAY, NOVEMBER 9, 1912

Subscription - 10 Cents a Copy
$3 a Year U. S., Cuba and Mexico
$4 Canada, $5 Other Countries

A RULE OF LIFE.

Let every man be occupied, and occupied in the highest employment of which his nature is capable, and die with the consciousness that he has done his best.—Sidney Smith.

President-Elect Wilson's Statement.

Emerging triumphant from the downpour of ballots that insures him four years' residence in the White House, Woodrow Wilson, president-elect of the United States, assures the business interests of the country that they need have no fear of governmental interference so long as they abide by the law. This announcement fits in snugly with the general hope of the country. Mr. Wilson's ante-election statement should be read carefully. It follows:

"The result fills me with hope that the thoughtful progressive voters of the nation may now at last unite to give the country freedom of enterprise and a government released from all selfish and private influence devoted to justice and progress.

There is absolutely nothing for the honest and enlightened business men of the country to fear. No man whose business is conducted without violation of the right of free competition and without such private undertakings and secret alliances as violate the principles of our law and the policy of all wholesome commerce and enterprise need fear either interference or embarrassment from the administration.

Our hope and purpose is now to bring all the forces of the nation into active and intelligent co-operation and to give to our prosperity a freshness and spirit and a confidence such as it has not had in our time.

The responsibilities of the task are tremendous, but they are common responsibilities which all leaders of action and opinion must share. And with the confidence of the people behind us everything that is right is possible.

My own ambition will be more than satisfied if I may be permitted to be the frank spokesman of the nation's thoughtful purpose in these great matters."

That this platform remains in active force for at least four years from March 4, next, should be the earnest prayer of every citizen of the republic, and each should do his part to help carry it out.

The Troubleman and His Work.

The manner in which a troubleman proceeds to determine the location of trouble indicates whether he is a man who is an asset or a detriment to a company. In many cases the troubleman often clears the trouble by juggling the equipment and not by systematic testing, or deductions.

The troubleman should act entirely upon the word of a tester, as much delay may be obviated with this understanding. It is important, however, that the test board man should have the complete confidence of the troubleman and a reputation for making careful and accurate measurements. If the tester has any doubt as to the accuracy of his test, due to high resistance, etc., it is best to so inform the troubleman, giving him all information possible.

When a case of trouble is reported by a subscriber, the troubleman can make certain deductions as to the location of the trouble by careful questioning. Then by a process of elimination decide upon the probable cause and test accordingly. His tests will reveal the accuracy of the deductions and point the way to the trouble.

Don't Miss the Service Association Meeting.

On November 12, as stated elsewhere in this issue of TELEPHONY, there will be a second meeting of the men composing the Central States Telephone Service Association. It will be held, as was the first, at the Hotel La Salle, in Chicago. It is of the first importance that every Independent telephone operator in the central states be there in person, or be represented by some one qualified to act for him.

As this paper has made plain, the fundamental basis of this organization is service—service uniform and of the highest grade—service for every company, large or small. As members of the Central States Telephone Service Association, every company will be on a level, and the opportunities this offers the smaller operator are invaluable. All are to receive the benefit of specialists in every line. And the cost is to be negligible, not high.

At the meeting to be held next week the committees appointed at the first meeting are to report. Definite progress has been made by them all, and particularly by the committee on uniform operating rules. It is understood that this committee has completed its work and has devised a set of rules, together with a code, which may and should be adopted by every company in the territory affected by this movement.

The discussions at the coming meeting will cover the broad questions of service from every angle. Every man present will have an opportunity to express his views and, from the symposium thus obtained, practical methods will be developed. This is a time for concerted action. The new association offers valuable aid—it will not hamper the operations of any company. It aims to co-operate with the established state and national bodies, not to oppose them, and its operations seem bound to stimulate the business to a wonderful extent. Be sure to be at the La Salle Hotel next Tuesday!

The Telephone and Election Returns.

Within the memory of the youngest voter in the United States is the time when the results of a presidential election were not known until a late hour of the election day and, in some cases, until early the following day. In those days the men folks usually went downtown to the headquarters of their political parties and there, amid the dense smoke of many campaign cigars passed many long hours awaiting the returns. The news was slow in coming in and but few returns were received before midnight.

The women folks and children, although just as interested as the men in learning the name of the successful candidate, were, as a rule, obliged to retire for the night with their curiosity unsatisfied. Frequently they did not receive the news until the next morning, although sometimes the lady of the house awaited her husband's, more or less cheerful, return in the wee, small hours.

The slowness in gathering the returns was due in a great degree to lack of facilities in getting the counts to the various telegraph offices. With the introduction of the telephone, the election officials recognized a means for facilitating the gathering of the returns, especially in the large cities having many precincts. It rapidly became an indispensable adjunct in the collection of the election results, both in cities and rural districts.

The result of the extensive use of telephone facilities has been to eliminate many hours of impatient waiting by a great number of people in all parts of the country. But the speeding up in the gathering of returns was not the only thing accomplished. The telephone was put to work to disseminate the information which it was so instrumental in collecting. As early as 1896, some provision was made for giving out election news by companies in several cities.

Since then the methods and equipment for gathering and distributing election results to the public have been gradually improved. The use of the telegraph on composite toll circuits, as told on other pages, enable the Chicago Telephone Co. to obtain reports from every political center of the country and to distribute them to thousands of its interested subscribers. No longer have the men folks a valid excuse for going downtown alone on election night. They can now stay at home with their families and receive the bulletins from the telephone company which give them all the news, national, state and local.

For The Love of The Work.

"The man who is most wanted for a position of trust is the one who does not work for mere selfish gain, but for the love of the task," says President Taft. "If he does his work for love of it, and not out of consideration alone for the result, he will serve his own interests best, for he will do his work well, and thereby make himself indispensable to his employer; and when the time comes to choose a man for a higher position, the choice will likely fall upon him who has done his work well."

In the president's position the question of placing men in the innumerable openings in the government service has been brought prominently before him. Speaking from experience, he is entitled to be heard with respect. Incompetence, coupled with greed for salary, and not joined to any love for the work, or a desire to do the work well for the work's sake, are found on every hand.

The man who possesses qualities the reverse of these is the exceptional man, deplorable though such a confession is; he is the man for whom every employer is looking and for whom the fat salaries and the congenial work are waiting. It is not at all impossible for a man to train himself to this attitude toward his work. If he is in the wrong business and cannot arouse any enthusiasm within himself for his tasks, it is high time he got into something else, over which he can kindle the divine spark.

TO INDEPENDENT AND BELL COMPANIES.

In connection with the information we are now gathering for the forthcoming edition of TELEPHONY'S Directory of the Telephone Industry, we are compiling certain additional and unusual statistics. To the end that this data may be comprehensive and as complete as possible, we ask every telephone company to mail us a copy of their latest directory. We trust all will respond promptly, and assure each of you that the courtesy will be appreciated. Please address it to TELEPHONY, Monadnock Block, Chicago.

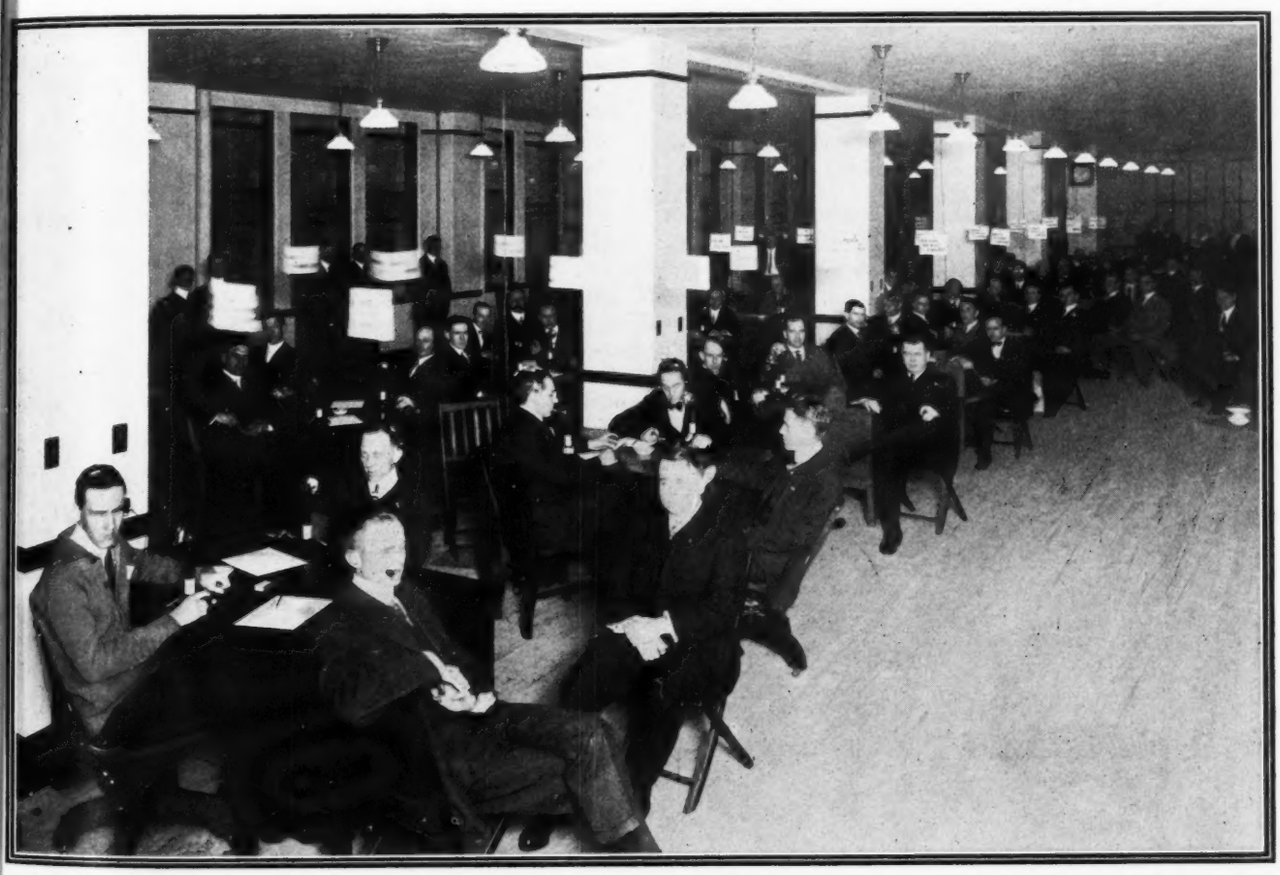
Distributing National Election Returns by Telephone

How the Chicago Telephone Company Furnished News Bulletins of the Presidential Election to Its Subscribers in and Around Chicago—Service Given Two Hundred People at a Time—Description of the Method, and Arrangement of Equipment

By M. D. Atwater

Last Tuesday witnessed the close of the presidential campaign and on that day it was decided who would occupy the White House at Washington for the next four years. Young and old were interested in the election and anxious to obtain information regarding the result at the earliest moment. In the gathering and dissemination of the election figures, the telephone took a prominent part. The arrangements by the Chicago Telephone Co. to furnish the public the news, were probably the most extensive and efficient of any which have been used.

National returns were distributed by telephone on the evening of November 5 from the new headquarters building of the Chicago Telephone Co., in a most systematic and satisfactory manner.



The Telephone Bulletin Department from Which Returns Were Distributed to the Various Telephone Exchanges in and Around Chicago.

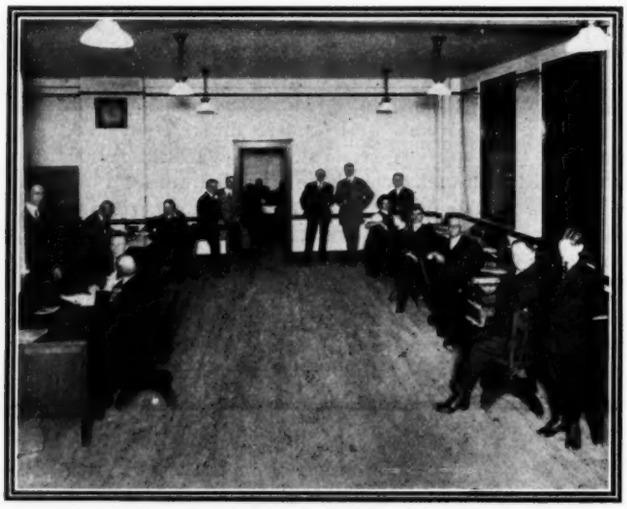
The news was collected by telegraph over composited toll lines from all political centers of the country. It was then distributed by local telephone circuits to 27 Chicago city exchanges, by long distance telephone to 55 towns in northern Illinois, and by telegraph to five other distributing centers in the state.

On the twelfth floor of the newly completed building in Chicago, a large private office was reserved for the corps of bulletin editors. Several of the telephone company's ablest and most experienced officials undertook the task under the supervision of Commercial Superintendent W. R. Abbott. Just outside this room were located the instruments of the incoming telegraph circuits which brought the national returns, and the incoming telephone circuits from local and state headquarters. All the data received was summarized and digested into a series of ten-minute bulletins, which were writtent in triplicate and carried by messengers to readers, who dictated to groups of manifolding clerks. In this manner, 48 copies were quickly prepared for distributing the news to the public.

The long, open, adjoining room in the north wing of the building had been filled with over fifty desks arranged in two rows, as shown in the illustration, and every desk was equipped with a telephone on each side. At these instruments were seated the men who read the manifolded bulletins to groups of local or suburban exchanges, as listed on the cards suspended over the desks.

There were 14 city distributing telephones, reaching 27 city offices, and 20 suburban and toll circuits, reaching 55 towns in northern Illinois and forwarding Chicago bulletins direct as far as Danville, Kankakee and Rockford. Beyond this radius, the news was distributed by telegraph to Davenport, Peoria, Springfield, Murphysboro and Cairo, each of which centers had made provision for distribution by telephone.

Perhaps no other building in the world is so well prepared as the Telephone Building to take care of an emergency telephone installation on a large scale. Although so many telephone lines were desired in one room on short notice, the house wiring system was of such capacity, that not a single exposed



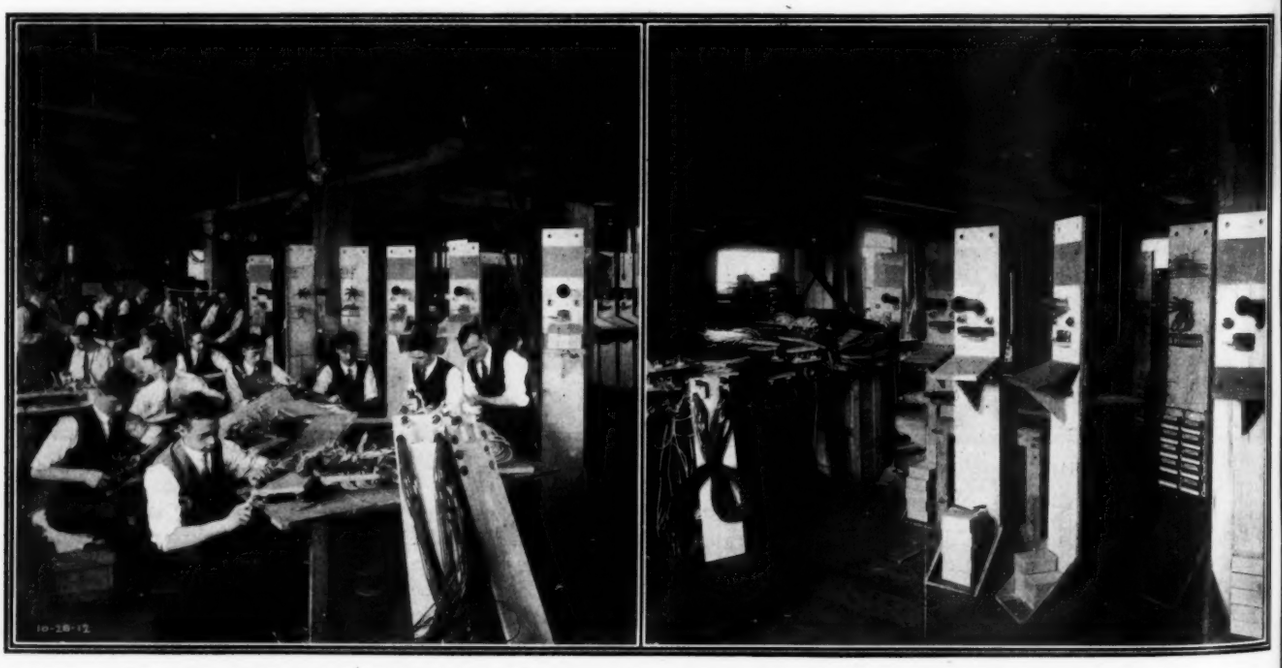
Telephone and Telegraph Were Used to Gather the News.

wire was necessary. Five 600-pair lead covered cables are installed in the vertical cable shaft which passes, at each floor, through a large closet with double doors opening into the hall and exposing its entire interior. In these closets distributing frames are mounted, each of sufficient capacity for a rural exchange. One hundred pairs of cable conductors terminate on each of these racks and also five 40-pair cables from the floor conduits. These floor conduits have openings so arranged that any desk in the building is within six feet of a telephone circuit. In consequence of this liberal allowance of conductors, it was possible to make the installation of this elaborate bulletin system, without drawing in any additional wire.

By display newspaper advertising, the general public had been notified to call for "Election News", if information was desired regarding the election. On calls from public pay stations or nickel telephones, the regular charge was made. The "A" operator receiving such a request, would pass the number over an order wire to a special "B" operator. The latter's position was equipped with two special groups, one red, the other white, of cords hung from a board mounted temporarily over the top of the switchboard. Each of these two groups of cords was associated with a signal lamp of the same color. Sixty-eight such sets were made up in the shop, as shown by the illustration, requiring 4,500 six-foot steel cords in addition to 1,600 shelf cords rewired for the occasion.

At each local exchange the bulletin from headquarters was taken down and passed to a reader who gave it to the public through a specially equipped bulletin set connected directly to these cords. In some vacant corner of each operating room was placed a temporary bulletin reading set, also made up in the Chicago Telephone Company's shop, as were the special cords. Each of these desks carried a set of from two to eleven operator's transmitters connected by separate short tubes to a common mouthpiece made of tin.

It was found by experiment, that the tin mouthpiece improved the transmission of this compound instrument almost 50 per cent. over that of a fibre or rubber funnel. Each of the transmitters had its own induction coil and condenser mounted with it, as in the wiring of the standard Bell subscriber's circuit. Standard repeating coils also were mounted on the set and wired to feed battery to the transmitters, but not to the line. The subscribers, therefore, while hearing election returns, were unable to interrupt. Moreover, the cut-off relays were held up by current over six- to twelve-volt taps from the office battery through the cords, so that no signaling by subscribers could interfere with the bulletin service. By using the low voltage taps for this purpose, the insertion of resistance coils was obviated. Each transmitter of the set was wired to two groups of twenty cords and gave excellent transmission. The reading set was also equipped with a set of self-restoring switches, which were operated by a common lever and threw



The Assembling of the Special Equipment Used in the Exchanges for Giving Out Election Returns.

the compound transmitter from the red to the white group of cords.

Two snap switches on the reading set controlled the signal lights before the special operator at the switchboard. In operating this system, the reader would switch on a lamp before the special "B" board operator, directing her to use one of the two

groups of cords, exclusively, for putting up subsequent connections, while he read to the other group.

Each bulletin, being comprehensive in its information, was about one manuscript page in length and required two minutes in the reading. At the end of a bulletin the reader would announce, "Please hang up your receivers, another bulletin will be read in ten minutes", and would signal the operator to take down all the cords of the group while he switched his transmitter to the alternate group, and repeated the bulletin.

The heart of this elaborate bulletin system was the special connecting board on which appeared all the election circuits. For this purpose, a spare section of the "A" board of the Main Exchange had been reserved. Here every bulletin distributing loop was terminated, and here battery was applied through cords to the local distributing telephones at the reading desks. As each distributing telephone was connected to two or three local exchanges, it was necessary to strap two or three jacks together and wire the cord circuits so that only one of them would furnish the battery to the reading transmitter, although battery was fed over all of them to hold up the trunk guard relays and prevent disconnects. The necessary trunk circuits had been appropriated for this exclusive purpose during the evening.

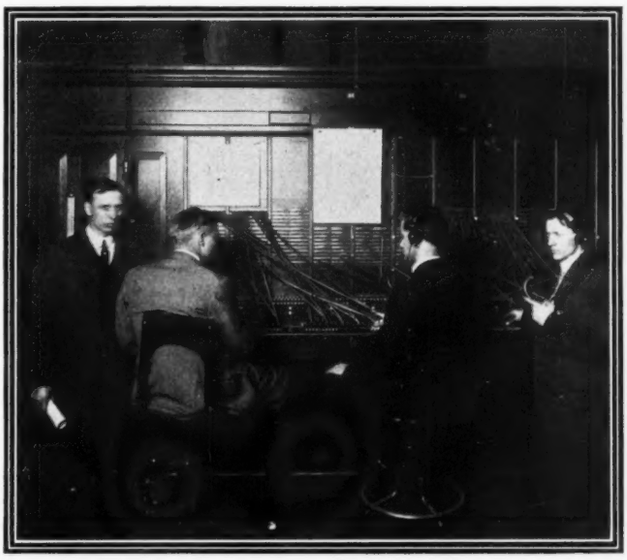
For toll service a different cord circuit lay-out was necessary,

Arrangement of Cords for Bulletin Service.

as the talking current was applied to the reading transmitter at the special connecting position in the standard manner. The battery was cut off from the toll side of the repeating coils, and the circuits were connected through straight cords at the toll board, leaving them free of all signaling equipment. Competent wire chiefs were on duty at this special position and bulletins giving all circuit features were posted for their guidance.

Thorough provision was made for testing and supervising all this bulletin service from headquarters and also from the field. Several spare desk sets were installed at one end of the distributing room with loops which terminated on answering jacks at the special connecting position. Circuits were established from this point to each of the 27 local exchanges where bulletins were being given. These circuits terminated in answering jacks with lamps at each end. The supervisor of service therefore could order up a local line to any desired exchange "A" board. He could then ask for and receive the same sort of bulletin service as was being given to the public. As these circuits had lamps at the connecting position, the equipment men at the various exchanges were able to use them in reporting direct to headquarters any plant difficulties which arose.

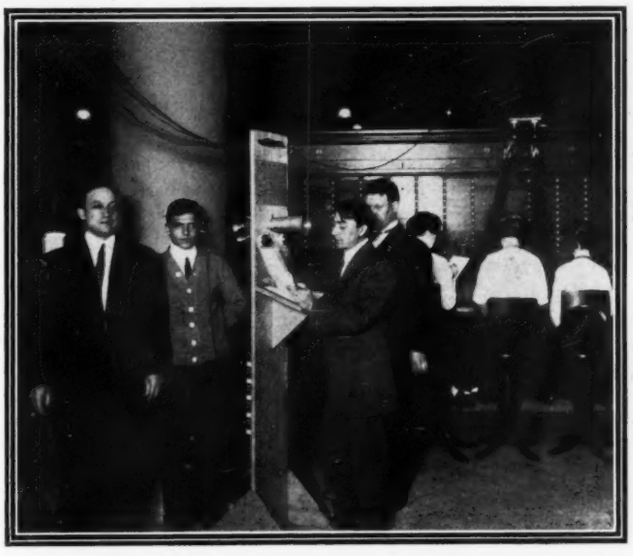
A complete system of inspectors of the toll bulletin service in the field was organized. Six men, traveling by carefully prepared railroad schedules, visited all the suburban cities during the evening, placed calls for bulletins, observed conditions, and reported by telephone over a special toll loop to traffic supervisors at headquarters. Thirteen large common battery exchanges, i. e., Oak Park, Joliet, Evanston, Elgin, Aurora, Ham-



The Heart of the System—Connections Direct to Distributing Points.

mond, Waukegan, Gary, La Grange, Chicago Heights, Wilmette, Maywood and Hyde Park, used the compound transmitters which alternate the groups of special cords, giving out returns by the methods used within the city.

Other suburban common battery offices equipped dead switchboard positions with cords without battery to prevent interruptions, and by throwing keys together, were prepared to read bulletins to a number of subscribers simultaneously.



Reader Giving Election Returns to the Public.

Even simpler methods prevailed in the rural places tributary to some of the distributing centers.

The design and installation of all this special apparatus fell to A. P. Hyatt, equipment superintendent. As the description indicates, about 90 per cent. of the preparation was shop work. Only three weeks' notice was given Mr. Hyatt to undertake

this task, and as the engineering required several days, the actual labor of manufacture and installation had to be accomplished in ten days.

H. N. Foster, who was in charge of the service, issued complete instructions to his force, days ahead of time, so that each responsible employe was familiar with his duties.

H. F. Hill, general manager of the Chicago Telephone Co., for Illinois, was the high official who was responsible for the entire bulletin service of the state, and the organization, system and discipline which were so successfully developed were due to his efforts.

More than a hundred clerks and readers, including reliefs, were required to be on duty at 4 p. m. on election day, and were not dismissed until midnight. The large lunch room on the eighth floor of the toll building, which is used by the company for its Monday luncheons, was thrown open for the evening, and the bulletin force was served in relays, partly by young women from the office of the traffic department.

Among the interested visitors at the telephone bulletin department were Mr. Nakagama, of the Imperial Service of Japan, a guest of Wm. P. Sidley, vice-president and general counsel of the Western Electric Co., and also Messrs. Turner and Odell, of the telephone branch of the British Post Office.

The enormous load thrust upon the operating department by the bulletin service was not allowed to interfere with or impair the general service in the slightest. Although election night is a holiday occasion, the evening traffic was unusually heavy. However an ample force of experienced operators was kept on duty so that the regular business was handled with exceptional promptness and accuracy.

Operating Rules for Central States Association.

The committee on operating rules, appointed at the recent meeting of the Central States Telephone Service Association, held a meeting at the La Salle Hotel, Chicago, on October 29, 30 and 31.

Every member of the committee was present, and the three days of the meeting were well spent in preparing a set of operating rules for the use of the companies in the territory covered by the recently formed association. In making up these rules, the rules of the Michigan Traffic Association were taken as a basis, and changed to meet the conditions of the territory covered by the association.

A code for operators was adopted; many new symbols being added to that in use by the Michigan association. The rules as agreed upon at the meeting of the committee will be put in shape and presented at the next regular meeting of the association, which will be held at the La Salle Hotel November 12.

One of the important features which will be recommended by the committee is a standard toll ticket. It is expected that the adoption of this form by the association will enable telephone companies to obtain a greatly reduced rate on toll tickets. The committee will take definite action regarding this before the regular meeting of the association is held.

The members of the committee in attendance at the meeting were greatly impressed with the consideration given them by the management of the La Salle Hotel, as lunch was served in the committee room, thus saving considerable time to those in attendance.

W. S. Vivian was especially active and rendered valuable service in the drafting of the rules. Those present at the meeting were: W. S. Vivian, secretary, Michigan Independent Telephone & Traffic Association, Grand Rapids, Mich.; J. W. Casey, traffic manager, Kinloch Telephone Co., St. Louis, Mo.; H. D. Stroud, traffic manager, Illinois Telephone & Telegraph Co., Chicago; F. L. Eldridge, special agent, Illinois Telephone & Telegraph Co., Chicago; W. S. Fisher, general manager, Eastern Illinois Independent Telephone & Telegraph Co., Kankakee, Ill.; H. B. Gilmore, secretary and manager, Independent Toll Clearing Co., Springfield, Ill.; E. P. Daicey, general manager, South Bend Home Telephone Co., South Bend, Ind.; L. C. Griffitts, general manager, Inter-State Independent Telephone & Telegraph Co., Aurora, Ill.; C. E. Tarte, general manager, Citizens Telephone Co., Grand Rapids, Mich.

At the next meeting of the directors of the National Independent Telephone Association a representative of the Central States Telephone Service Association will explain the objects and purposes of the new organization.

Texas Independent Association Meets.

The annual convention of the Texas Independent Telephone Association, just held at Dallas, was one of the most interesting and satisfactory meetings ever held in the state. W. C. Dillon, newly elected secretary, reports to TELEPHONY that it resulted in the completion of more actual business which will eventuate in a greater development throughout the state, than any similar meeting he ever attended. Mr. Dillon declares that there is material in Texas for one of the strongest state associations in the country and that this coming year will see the Texas men forging to the front in real accomplishment.

The convention was called to order by J. C. Casler, of Dallas, president of the association. In his address, Mr. Casler dealt largely with the present prosperity and outlook for the Independent lines of the state. He proved by exact data that never before in the history of the Independent system has development been so marked, or the future so bright as at present. New fields will be opened throughout the state and new lines connecting all Independent properties in Texas are either now in course of construction or soon will be. With these conditions, combined with continuous betterment of the service, President Casler promised the delegates a new year that will be unequaled in its development of Independent service.

E. M. Chamberlain, of Greenville, declared that the hospitality of the local Dallas telephone men and the supply houses of Dallas was responsible for the large attendance that marked the opening of the convention.

The program having been arranged to cover a wide scope, the following papers were read, each of which was followed by a general discussion of the subject: "Development of North Texas Local and Long Distance Business," C. A. Shock; "Eliminating Telephone Trouble," O. G. Freeman; "Toll Line Development in Texas," Buford Adams; "Keeping in Touch with the Subscribers," F. V. Newman; "Relation of the Independent to the Mutual," J. L. Curdy; "Relation of the Mutual to the Independent," J. F. Parker; "Central Office Discipline," W. K. McQuown; "Toll Accounting Between the Different Companies," J. B. Earle; "Suggestions as to the Best Methods of Handling Through Toll Business," J. M. Henshaw; "Soliciting New Business," Geo. B. Wellbaum.

Another important matter was a general discussion covering the proposed appointment of a state public utility commission. The present gross income tax was also taken up. In this general discussion nearly every delegate was heard from. A resolution protesting against the proposed appointment of a state public utility commission was adopted. Also one against the present gross income tax.

At the conclusion of business the following officers were elected for the ensuing year: J. B. Earle, of Waco, president; F. V. Newman, of Dallas, first vice-president; A. J. Combs, of Haskell, second vice-president; F. E. Ebersole, of Houston, third vice-president; W. C. Dillon, of Corsicana, secretary, and W. E. McQuown, of McKinney, treasurer. The committee comprises the officers and J. C. Casler, of Dallas, and C. A. Shock, of Sherman.

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities, and Actions of City Councils Bearing Upon Franchises, Rates and Service

New York Commission Rulings.

The New York Public Service Commission has received complaints that in certain instances prepayment has been made for delivery of telegrams when, in fact, the messages were delivered by telephone without charge.

Following an investigation by the division of telegraphs and telephones a statement has been received from the Western Union Telegraph Co. that the entire subject has been taken up by its operating officials and accounting department, and that it is issuing instructions that, in every case in which the message is telephoned to the addressee without expense for the telephone service, and where the addressee expresses himself as being satisfied with the telephone delivery, and as not desiring the delivery of a written copy of the message by messenger, the office of destination shall notify the office of origin by mail of the facts and request the originating office to refund the delivery charge to the sender. The originating office will, thereupon, make such refund.

The commission has received notice from the New York Telephone Co. that it has purchased the physical property of the Schenectady Telephone Co., operating in Schenectady and vicinity, for the sum of $93,500 and the assumption of the payment of $214,500 of mortgage bonds.

The commission is also advised of the purchase of the physical property and business of the Hamilton Telephone Co., operating in Hamilton and vicinity, for the sum of $11,850.

The commission has granted permission to the New York Telephone Co. to reduce the rates for business and residences in the city of Albany, effective November 1, 1912, as recently agreed at a hearing. The new rates provided for in the schedule are as follows: Direct line business, $72; two-party line business, $60; direct line residence, $42; two-party line residence, $30; four-party line residence, $24; extension telephones at business places and residences, $6.

The commission has authorized the Northwestern Telephone & Telegraph Co., which operates in and about Carthage, N. Y., to issue its 20-year gold coupon bonds, bearing interest at the rate of 5 per cent. per annum, to the par value of $11,000, bonds to be sold at not less than 95. The proceeds are to be used for a new switchboard, new cables, new toll circuit between Carthage and Black River, new toll circuit from Benson Mines to Harrisville, and for refunding obligations of the company incurred for capital purposes.

Reach Agreement as to Baltimore Rates.

The flat rate telephone service for business houses in Baltimore, Md., will be continued until January 1, 1913, and will then be superseded by the measured service, at least temporarily, as the result of an order issued last week by the Maryland Public Service Commission, with the approval of both the Chesapeake & Potomac Telephone Co. and the Telephone Protective Association.

This is considered a long stride toward an amicable settlement of the controversy over flat rate services which was forecast some time ago.

Under this order it is provided that the flat rate services in use prior to the order of the commission passed in the telephone case on January 2, last, shall be continued until January 1, 1913, regardless of whether any such services may have been supplanted by the measured service.

In consideration of this extension of the flat rate service for three months from October 1, when it was to have ceased, the Telephone Protective Association, on behalf of its members, agrees to accept the measured service on January 1, pending further investigation.

The order of the commission provides that, on April 1, 1913, a hearing will be given the Protective association and other complainants against the substitution of measured service for flat rate.

The association has filed with the commission a statement showing briefly certain flat-rate charges in other cities and asked for time to compile more data. This is granted, with the consent of the telephone company, in the three months between January 1, 1913, and April 1, 1913, when the new hearing will commence.

Both sides of the controversy feel that the order will go far toward settling the issues involved. By running the flat-rate service until January 1 and then substituting the measured service, the hearing in April will have the advantage of an exact comparison of each service in the case of every holder of the old service.

Moreover, all disputes as to legality of various modifications made in the original telephone order by the Public Service Commission since then are settled by the agreement of both parties to the controversy.

In a lengthy joint statement prepared by the telephone company and the association it is stated that the company has given assurance that any benefits to be had by subscribers from future changes in schedules will apply to those subscribers who have now or may within the next few months surrender their old contracts.

New York City Independent to Appeal Case.

The New York Electric Lines Co., which is controlled by the Great Eastern Telephone Co., will carry its fight for permission to lay telephone wires in the conduits in New York City to the United States Supreme Court. A petition asking permission to appeal from the ruling of the court of appeals was granted by Associate Justice Hughes and has been filed in the supreme court. It is claimed that if the opinion of the court of appeals is correct the state law conflicts with the federal law.

Talk Independent for Trenton.

Every member of the Chamber of Commerce of Trenton, N. J., has pledged himself to keep a count of the number of telephone calls used at his place of business and his home, and, at the end of two weeks, to report, so that a statistician may compute the cost of erecting an Independent plant to connect all the telephone users in that city in a mutual company in order to fight the increase in rates ordered by the New York Telephone Co. When the data is complete citizens will be asked to subscribe to stock in an Independent city system.

Salt Lake City Commercial Club to Investigate Service.

The agitation brought about by inefficient and unsatisfactory service which it is claimed is furnished by the Mountain States Telephone & Telegraph Co., has induced the Commercial Club, of Salt Lake City, Utah, to appoint a committee of 21 members

to investigate the matter. It is to report findings with recommendations for the betterment of the service at a regular meeting of the club before taking any drastic steps

Claims for Damages by New York Canal.

The New York state board of claims has received a list of claims for the appropriation of lands for the state barge canal, which wiped out a number of small telephone lines owned by the American Telephone & Telegraph Co. The claims include: In Waterford and Halfmoon, Saratoga county, $4,350; Palmyra, Wayne county, $5,000 and $750; Arcadia, Wayne county, $4,000; Galen, Wayne county, $3,750; Tyre, Seneca county, $3,500; Macedon, Wayne county, $850; Galen, Monroe county, $850; Brighton, Monroe county, $700; and Lyons, Wayne county, 500.

Orders Electric Lines Overhauled in Ohio.

The Public Service Commission, of Ohio, on its own initiative, recently investigated the condition of the poles and lines of the Shreve Electric Light & Power Co. and the Citizens Electric Light, Power & Heating Co., in Shreve, Ohio, and has issued an order directing both companies to thoroughly overhaul their lines. They are ordered to take up slack, plant new poles, relocate the lines and do anything else required to prevent them from coming in contact with each other, or with the lines of any other company.

Sues Pioneer Company for Refunds.

Following the decision of the Oklahoma supreme court that the raise in rates made by the Pioneer Telephone Co., in Oklahoma City, in 1909, was illegal, James S. Wayford, has commenced proceedings before the State Corporation Commission to require the Pioneer to return to subscribers the amounts collected since June 1, 1909, in excess of rates in force at that time. This will amount altogether to approximately $60,000.

Southern Bell Changes Name and Increases Stock.

The charter of the Southern Bell Telephone Co. has been amended, changing its name to Chesapeake & Potomac Telephone Co. and increasing the capital stock from $6,000,000 to $10,000,000.

Wisconsin Association on Accounting Plan.

[EDITOR'S NOTE: The following comment on the accounting plan, proposed by the Interstate Commerce Commission for all telephone companies under its jurisdiction, has been filed with the commission by the Wisconsin State Telephone Association.]

This memorandum relates to the application of the tentative classification of accounts for telephone utilities embodied in accounting series circular No. 30 of the Interstate Commerce Commission.

1. It is contended that a rate controlling commission ought to be satisfied with the information which is necessary to be obtained for the successful operation of the utility control.

2. We greatly appreciate the fact that the Interstate Commerce Commission has seen fit in its tentative classification to lay down the rule that accounts should be kept in such manner as will admit of the utility reporting its operations by exchanges when called upon, but we are of the opinion that each utility reporting is entitled to a comparison of its exchange unit with the exchange unit of the same size of other utilities, and for this reason we submit that all utilities should be required to make a separate report on each unit operated by it.

3. From experience covering several years, we are of the opinion that the accounting of telephone utilities, while more or less in a class by themselves, are more akin to gas and electric utilities than they are to railroad utilities. For this reason the information required by the management in regard to the expenses of operation lies along the lines of departmental costs, and we have found it comparatively simple to arrange our costs to show:

1. Cost of operating central office.
2. Cost of operating wire plant.
3. Cost of operating subscribers' stations.
4. Commercial expenses.
5. General expenses.

The sub-divisions contained under the various heads in the tentative classification contained in circular No. 30 do not vary greatly from those which our experience has proved to be required, but it is our contention that the various subdivisions should be regrouped under the headings which from our experience we have proved to be efficient and requisite to the economic management of our business.

When we draw your attention to the fact that maintenance expenses, as called for by the tentative classification in circular No. 30, forms practically 54 per cent. of the operating expenses of the telephone plant, and also to the fact that the greater number of utilities operating will come under the heading of class "C," in which case this amount will be reported in one sum irrespective of what division of service the maintenance relates to, we respectfully submit the suggestion that the general headings of expense be revised to conform with those already enumerated and that class "C" companies be required to keep a subdivision of each expense as between maintenance and other expenses.

In this way the Interstate Commerce Commission could very easily, if required, call for a separate exhibit of maintenance from each company and the departmental cost which our experience has proved so satisfactory, could be continued. Again the question of compulsory physical connection is attracting special attention at the present time, and we fail to see how this matter can be adjusted except on the basis of the cost of the operations of that connection.

4. The tentative classification of accounts considers all rents as an addition to or a deduction from income. In so far as rent of buildings is concerned the treatment of rents in this manner would probably give better comparisons of the results of one company with another, but when we come to the rent of equipment, pole rent, etc., we cannot regard rent as other than an operating expense, since it includes in most cases, maintenance, depreciation and repairs. The item of true economic rent included therein in addition to these items being practicably indeterminable, and for the purposes of reliable comparison it is our contention that such rents must be included as operating expenses.

We submit the foregoing objections to the interim classification contained in circular No. 30, on account of the fact that our experience has taught us that the operation of a telephone utility requires accounting by operation and also for the reason that we believe that all state controlling commissions will require similar information so that if the interim classification contained in circular No. 30 be adopted as final it will require all companies, but more particularly the class "C" companies, to keep their accounts in such detail as will enable them to make reports to both the state and the interstate commissions. If such be the case a great hardship will be entailed on the small class "C" companies whose facilities for the keeping of accounts are extremely limited and it is only after two years of hard work on the part of this association that we have been able to bring the small companies in Wisconsin into the line of keeping their accounts in accordance with our instructions.

A Quartet of Men Prominent in the Telephone Field

G. BARRETT RICH, JR., assistant secretary and manager of the commercial department of the Federal Telephone & Telegraph Co., Buffalo, N. Y., was born in Buffalo, August 11, 1875. He graduated from Yale University in 1897, with the degree Ph. B. Prior to entering the telephone field, he was for three years in the traffic department of the Buffalo street railway. In 1902 he associated himself with the engineering department of the Frontier Telephone Co., operating the local plant in Buffalo. The following year he was made manager of the Haines Telephone Co. and, in 1904, he became connected with the Federal Telephone & Telegraph Co. Mr. Rich has been very successful in promoting pleasant relations between the Federal company and its subscribers and in widely increasing the service throughout the entire system. He is a thirty-second degree Mason and a member of the University Club, the Buffalo Canoe Club, the Rotary Club, the Sons of Jove, Sons of American Revolution, United Spanish War Veterans and is a director of the Chamber of Commerce.

W. H. BRYANT, vice-president and general manager of the Home Telephone Co., Mobile, Ala., has been associated with that corporation for over fifteen years. He was born in Nashville, Tenn., July 27, 1869, and was educated in the schools of that city and the Barton Academy. In 1887 he became an inspector for the Bell Telephone Co., at Mobile, remaining with that organization for about two years. Leaving the Bell service, he took up telegraphy and held a position as operator for a year, when he opened an electrical supply business in Mobile. This he conducted until August, 1897, when he went with the Home Telephone Co. Mr. Bryant is a member of the I. O. O. F., the W. O. W. and the K. & L. of H. He has been actively affiliated with the National Independent Telephone Association since its organization, as also with the Mississippi Independent Telephone Association. He is a member of the executive committee of the Mississippi organization. In a territory where competition has been particularly keen, Mr. Bryant has built up and is successfully maintaining a strong Independent property.

GEORGE R. FULLER, president and general manager of the Rochester (N. Y.) Telephone Co., is also president of the Interlake Telephone Co., the Bergen Telephone Co. and the Brockport Telephone Co.; and vice-president of the New York State Independent Telephone Co. He was born in Massena, N. Y., April 7, 1850. Aside from his telephone connections, Mr. Fuller is president of the George R. Fuller Co., manufacturers of surgical appliances, artificial limbs, etc. In 1896 he interested himself in securing a franchise and enlisting capital for an Independent telephone company in Rochester. Later, when the company was reorganized in its present form, he became an executive officer and has since been active in directing its affairs. He has been connected officially with a number of other companies. The first president of the state association, he is now its treasurer. He was occupied in various departments of railway work from operator to traveling auditor, before taking up telephony. Mr. Fuller is a Mason and affiliated with a number of business and social clubs in Rochester.

WILLIAM COOK TRALLE, traffic manager for the Kansas City Home Telephone Co., Kansas City, Mo., was born in Cook county, Texas, October 14, 1878, and was educated in the grade schools and Spaulding's Commercial College, in Kansas City. In 1890, he entered the employ of the Missouri & Kansas Telephone Co., spending five years in the repair shop and store room. From 1895 to 1897 he was stationed at Independence, Mo., returning to Kansas City as inspector. In 1899 he went to Galveston, Texas, as inspector and chief operator for the Southwestern Bell. A year later he came again to Kansas City, occupying the following positions: Test table man, assistant chief inspector, chief installer, chief clerk to city foreman of construction, service inspector, traffic clerk, chief clerk to manager of operating, and wire chief. From 1908 to 1910 he was assistant traffic manager for the Home company, when he went with the Southern Bell as district traffic chief, at Richmond, Va.; thence to a similar position at Wichita. He assumed his present position in September, 1910.

Abstract of Report on Situation of Chicago Bell

An Investigation Made for the Chicago City Council Committee on Gas, Oil and Electric Light to Furnish Data Upon Which to Base New Rates for Five Year Period as Prescribed by City Ordinance—First Installment

By Prof. Edward W. Bemis

Alderman Anton J. Cermak, Chairman Committee on Gas, Oil and Electric Light of the City Council, Chicago, Ill.

Dear Sir:

I herewith transmit the results of my studies of the Chicago Telephone Co. so far as they related to the ability of the company to reduce rates or improve the service.

Until the committee shall decide upon the wisdom of my recommendations upon these matters, an apportionment of the total amount of reduction in rates to the various classes of service need not be made.

Invaluable assistance has been rendered from the beginning to the present time by the accounting firm of Marwick, Mitchell, Peat & Co., and particularly by the head of the Chicago branch, James Hall, and his assistant, Andrew Sangster. Their work not only appears in the special report which they submitted to me some time ago, and which is herewith transmitted to the committee, but in the constant assistance they have rendered in following out, at my suggestion, special lines of inquiry into the accounts of the company.

In the large amount of investigation which has been necessary in the preparation of this report, the Chicago Telephone Co. has fully co-operated. The ordinance of November 6, 1907, gives the city access to the plants and accounts of the company. But the officials have gone farther than this, and have assisted in working out data and in making investigations requested by the city's representatives.

Very respectfully submitted,

Edward W. Bemis.

Introduction.

The regulation of telephone rates in large cities by any public body is practically a virgin field. Aside from the action of the Chicago city council, November 6, 1907, fixing the rates now charged in Chicago, there have been only two notable studies of the subject in this country. One in 1909-10 by the Massachusetts Highway Commission for Boston and its suburbs, and one in 1911 by the Maryland Public Service Commission, for the city of Baltimore.

There have been, to be sure, several investigations of the telephone rates in smaller places, by the Wisconsin Railroad Commission and the New Jersey Public Utilities Commission, but they have little direct bearing upon Chicago conditions. The same lack of application to conditions here applies to an investigation in Los Angeles and one in Seattle, in each of which cities there are two competing companies of substantially equal size.

No court or commission has thus far brought together such tabulated comparisons of operating expenses, construction costs, etc., per unit of telephone plant or of service rendered, as is the case with gas, electric light and street railways.

This has been partly due to the rapid growth of the telephone business and partly to the reliance hitherto upon competition in most sections outside of New England, rather than upon public regulation. With the tendency of late to division of territory between the Bell company and the Independent companies, the need of information to serve as a basis for public regulation is now seriously felt.

Furthermore, the relations of local Bell companies to the American Telephone & Telegraph Co., hereafter to be referred to by its usual abbreviation, the A. T. & T., are so close that it is difficult to study local conditions without the help of the national government as to the facts with regard to the parent company, whose business is nation wide. Fortunately, the power to secure this information has just been granted to the Interstate Commerce Commission, but it will take time to secure results from this source.

In Europe and Australia the telephones are so largely owned by the national governments, and conditions are so different from here, that little help can be secured in that direction.

All this, together with the magnitude of the interests at stake, make the Chicago investigation difficult. We have here to deal with the second largest telephone company in the world. Only New York has more telephones than Chicago. Contrast the 251,614 telephones in Chicago, January 1, 1912, with the 220,781 in London, 85,961 in Paris and 133,860 in Berlin, at the same time, and with the 453,000 in Greater New York, of which number 326,122 were in the Borough of Manhattan. According to the United States Consular Reports for 1912 (page 357), the entire number of telephones taken over by the British government on January 1 from the National Telephone Co. was only 560,000 for all of Great Britain and Ireland, or only 72 per cent more than were operated by the Chicago Telephone Co. in the city and suburban district, and only two and a quarter times the number within the city limits. The number of telephones throughout Canada in 1911, according to the United States Consular Report from March 28, 1912, was only 302,759, or less than in Chicago and its suburbs. The American Telephone & Telegraph Co. gives the following as the number of telephones (partly estimated) in various countries, January 1, 1912. The number in use by the Chicago Telephone Co. in the city and suburbs are given for comparison:

Chicago Telephone Co.	335,652
Canada	335,000
West Indies.	17,000
South America.	120,000
Australasia.	124,000
Oceanica.	17,000
Asia.	166,000
Africa.	41,000
Europe.	3,239,000

All the world outside the United States, Europe and Canada is reported as having only 517,000 telephones, or less than twice the number in the Chicago district.

Territory Covered.

The Chicago Telephone Co. embraces two divisions, the city and the suburban. The city division, with a population of 2,185,283 in 1910, covers the area of the city, which since July 17, 1911, has been 194.4 square miles. The suburban division, with a population of 656,655 in 1910, embraces 5,194 square miles, extending fully 100 miles along the lake and from 30 to 60 miles back from the lake. Thus the company, covering 388 square miles, embraces Lake, Cook, McHenry, Kane, DuPage, Kendall, Grundy and Will counties in Illinois, and Lake and Porter counties in Indiana. It includes, Elgin, Aurora and Joliet, Ill., Gary and Valparaiso, Ind., and toll lines to Kenosha and Lake Geneva, Wis.

There are 33 exchanges in the city and 95 in the suburban division; 25 of those in the city are of the central battery type, with a capacity of 4,900 to 10,500 subscribers. Of the exchanges in the suburbs, 23 are of the same type, averaging a capacity of about 4,900 subscribers. There

are in the city eight local battery type offices, often called magneto offices, and 72 in suburban districts; they average only 200 subscribers. Conditions in every way are quite different in the city and suburban district; in the former the wires are mostly in underground conduits, while in the latter they are in overhead cables or are bare wire on poles. In the city a large part of the service is on a measured basis; in the suburbs it is on a flat rate basis, such as is common in small cities and rural communities. The revenues and expenses, naturally, differ in these two sections. The city only has jurisdiction of the rates and services within the city, and special attention, therefore, must be given to that part of the business of the company. Since, however, it is one company in both city and suburbs, and since it is impossible to separate entirely the two branches, it is well to begin with a study of the company as a whole and then take up the city division.

Previous Investigations.

Three investigations of the Chicago Telephone Co. have been made. The first, covering substantially a year, under the auspices of the committee on gas, oil and electric light of the city council, aided by the telephone engineers, D. C. Jackson, W. H. Crumb and G. W. Wilder, ended with the passage by the city council of the telephone ordinance of November 6, 1907, under which the company is now operating. The second investigation concluded May 9, 1910, was by D. C. and W. B. Jackson, engineers, and Young & Co., accountants, for the year ending March 31, 1910. This was made to the city comptroller, W. H. Wilson, and was a supplement to a report they had already made, December 30, 1908, outlining a plan of accounting for the Telephone Co. The report of May 9, 1910, was considered by the committee on gas, oil and electric light, in various sessions, from May 19 to June 2, 1910. The fact that the accountants employed were also accountants for the telephone company led the committee to vote on June 2d that other experts should be employed to go over the report.

On June 16, 1910, the committee on gas, oil and electric light was informed by its sub-committee that W. J. Hagenah, of Madison, Wis., had been engaged to do this work. From January 5 to January 23, 1911, the committee considered Mr. Hagenah's report covering the calendar year 1909. To enable Mr. Hagenah to report on the changes in each of the several classes of rates that could be wisely made in connection with a total reduction of about $200,000, the committee, on January 23, took a recess.

The consideration of the final report of Mr. Hagenah, dated May 2, 1911, was postponed until after the consideration of the gas ordinance. Immediately thereafter, on July 17th, the undersigned was asked to take up the investigation. A prior engagement caused more or less of delay, until it finally seemed wise to include not only the prosperous experience of the company in 1910, under the reduced rates of the 1907 ordinance, but also to include the rapid growth of the company and its continued prosperity in 1911. It also developed, near the close of 1911, that the company, in the summer of 1911, had undertaken an expensive and exhaustive inventory and appraisal of all its property. It was so evidently unwise to ignore such an appraisal that no apology need be made for delaying the report until the company was able, August 17, 1912, to place the entire results of this valuation at the disposal of the city, and until those results could be given the consideration which their importance and bulk, in nine large volumes, demanded.

According to the Jackson-Young report, the existing rates yielded only 3.83 per cent. on the investment. After paying 5 per cent. interest on the bonds and 8 per cent. dividends on the stock, properly applicable to the investment within the city limits, there was, if the report be accepted, a deficit for March 31, 1909-10, on business within the city limits, of $908,533.52. These figures were based upon the theory of the investigators that the company was not allowing a sufficient amount for depreciation. The company had spent $622,296 that year on reconstruction and replacements. The investigators considered that the depreciation for the year was in excess of this amount by $956,626.20.

In his final report, for May 2, 1911, page 64, Mr. Hagenah estimated that the company, after paying interest on its bonds and 8 per cent. on the balance of what he considered its depreciated investment within the city limits, would have had a surplus in 1909 of $309,488.36.

When the committee on gas, oil and electric light was considering substantially these figures, on January 23, 1911, and was about to make a motion to reduce the rates charged by about $216,000, or about 2 per cent. of the gross receipts, the other $100,000 of surplus being considered as needed by the company for emergencies, B. E. Sunny, president of the Chicago Telephone Co., said:

"An attempt to distribute that amount, $216,000, would be futile, first, because the amount is wholly erroneous; second, that it would give the telephone company rates which would be unreasonable and which it could not accept. * * * There is no chance in the world of the telephone company being able to accept rates on the basis suggested."

The committee voted, however, as follows:

"That Mr. Hagenah be instructed to proceed with the preparation of the schedule of telephone rates on the analysis contained in the report made to the committee, and that he reduce the rates to the extent of the surplus, of approximately $216,000, where his cost analysis shows the present schedule to be excessive or inequitable, and that the said schedule of telephone rates be reported back to this committee for its future action."

Mr. Hagenah held that the plant had depreciated 22.5 per cent. and must set aside yearly $2,717,890 within the city for maintenance and to meet depreciation, or 13.65 per cent. of the then value and 11.61 per cent. of the book cost of the property, including land and working capital.

In this situation, with Mr. Hagenah basing the possibility of a reduction of $216,000 upon the assertion of an amount of depreciation which President Sunny denied, it became exceedingly important to have the fullest access to the books of the company throughout its history, and to study the appraisal just completed for the company by Byllesby and Arnold.

Some Contrasts With Other Companies.

The Chicago Telephone Co. differs from many other public utilities in several very important respects:

1. The company has not only thrown open all of its books and other accounts and plants to the inspection of the city's representatives, as contemplated in the ordinance of 1907, but it has freely given much other valuable material and assistance which it was under less obligation to furnish. Inquiries which called for considerable investigation were much more promptly and fully answered than is customary, or than could have been legally demanded. There has been no evidence of an attempt to keep back anything that was asked for relative to the company.

2. There have been no fires, suspicious or otherwise, to destroy the early records of the company.

3. There has been no change of ownership to complicate the situation. One company, and that one always controlled by the A. T. & T. Co., has been in charge since the first consolidation in 1881, two years after the beginning of the telephone business in Chicago.

4. There has been no telephone competition in the city since 1880, with the exception of the thus far negligible competition of the Chicago Tunnel Company.

5. There were no early losses or failure to pay both development costs and good dividends out of the revenues of the company from the very start.

6. While there have been increases of plant out of earnings and increases of stock to represent this new plant, without direct payment at the time in cash by the stockholders, the par value of the outstanding stocks, bonds and notes has rarely exceeded, and on January 1, 1912, did not exceed, the present value of the physical assets of the company. In other words, water, in the sense of the excess of outstanding securities above tangible assets, does not appear in the stock of the company.

Yr. Ended Dec. 31.	Earnings.	Expenses.	Net Earnings.	Miscellaneous Revenue.	Net Profit.
1891	$ 1,036,569.19	$ 597,469.90	$ 439,099.29	$ 3,689.45	$ 442,788.74
1892	1,194,715.58	738,184.30	456,531.28	4,093.15	460,624.43
1893	1,417,829.73	881,451.53	536,378.20	.....	536,378.20
1894	1,479,878.85	902,057.02	577,821.83	2,950.94	580,772.77
1895	1,616,028.79	1,036,396.64	579,632.15	18,931.87	598,564.02
1896	1,797,567.17	1,059,164.00	738,403.17	22,237.51	760,640.68
1897	1,908,615.11	1,039,169.47	869,445.64	18,869.85	888,315.49
1898	2,137,609.48	1,210,214.17	927,395.31	16,089.70	943,485.01
1899	2,480,184.12	1,477,596.99	1,002,587.13	17,930.53	1,020,517.66
1900	2,870,489.44	2,065,021.19	805,468.25	21,214.84	826,683.09
1901	3,484,130.95	2,197,770.28	1,286,360.67	27,226.89	1,313,587.56
1902	4,290,950.99	2,781,390.23	1,509,560.76	27,868.21	1,537,428.97
1903	5,308,201.13	3,495,831.06	1,812,370.07	45,315.03	1,857,685.10
1904	6,265,124.57	3,602,428.85	2,662,695.72	59,730.39	2,722,426.11
1905	7,016,057.39	4,348,963.09	2,669,094.30	42,149.07	2,711,243.37
1906	7,810,293.54	4,920,422.46	2,889,871.08	52,181.51	2,942,052.59
1907	8,635,102.08	6,621,059.09	2,014,042.99	56,703.06	2,070,746.05
1908	8,617,238.09	6,642,647.95	1,974,590.14	81,768.37	2,056,358.51
1909	9,745,954.46	7,238,688.52	2,507,265.94	54,589.07	2,561,855.01
1910	11,092,879.07	7,824,205.70	3,268,673.37	42,934.01	3,311,607.38
1911	12,474,022.15	8,836,827.49	3,637,194.66	43,540.78	3,680,735.44

Table No. 1. Expenses and Profits, City and Suburban, Before Making Additions to Depreciation Reserves.

7. A depreciation reserve of about $5,000,000, or over 15 per cent. of the outstanding stocks and bonds, has been accumulated out of earnings to meet depreciation, and has been invested in extensions.

Some of these points will be enlarged upon elsewhere. It is sufficient now to congratulate the Chicago Telephone Co. upon its unique position in combining so many good features.

The investigation of the profits and the regulation of rates are made far less difficult by the above situation.

On the other hand, because of the great size of the company, with over $35,000,000 of assets, and with a service touching most closely the homes and comfort and business of the entire city, and because of the novelty and complexity of the problems to be handled, there is call for the most thorough investigation and the most judicial thought that can be brought to the task.

The revenues of all the gas, water and telephone properties controlled by the Wisconsin Railroad Commission are no greater than those of the Chicago Telephone Co.

The Problem.

The problem before us arises from the ordinance of November 6, 1907, giving a franchise to the Chicago Telephone Co. until January 8, 1929.

It provided, with reference to that portion of the company's business within the city limits, a complete control by the city council of rates for periods of five years each, after the expiration of the first thirty months. The rates for the first two and one-half years were prescribed in the ordinance of 1907. Since the city council has not prescribed new rates since 1907, those ordered for the first thirty months, ending in April, 1910, have continued.

Evidently the first question to be determined is the amount of profit that the company has made during the four years of operation of the existing ordinance, and the ratio of that profit to the actual investment in the property.

Other questions will follow, such as the relation of investment to present value, the amount needed for depreciation, the reasonable rate of return, prospects of future profits and costs as affected by possible competition, the building of subways, etc.

Gross Earnings, Expenses and Profits.

In the following tables are presented the actual receipts and the actual expenditures as shown by the books of the company since 1890. Allowances for depreciation and other reserves not actually expended are omitted. The accountants have made a few minor adjustments of the books in the tables below, but only one is of sufficient importance to deserve mention, and that is of not any large importance.

Unusual expenditures of 1911 of $144,583.92 on account of the appraisal and $44,453.40 in connection with a strike, or a total of $189,037.32, were in large part thrown back and apportioned over the last seven years, thus making the burden less severe in 1911.

The investment in Table No. 2 is based on the cost reported by the company on its books without any deductions for depreciation.

Operating Expenses.

No conclusions can be drawn from the tables just given until a study is made of the operating expenses, investment and reasonable allowance for depreciation. Operating expenses will be first considered.

Of the total average expenditures for operation and new construction in 1911 of about $13,183,339.79, of which $8,836,827.49 was for operation, the payroll amounted to $6,332,485 and taxes to $720,000. There is no evidence that these expenses can be materially reduced. Expenditures this year in the department of station removals and changes are falling, but on the whole the upward trend of wages found in other industries has affected and will still continue to affect the telephone business.

In a report of the United States Department of Commerce and Labor to the senate, February 23, 1910, upon telephone companies (61st Congress, second session, document No. 380), it is shown (page 94) that outside of Colorado and further west, Chicago was paying higher monthly wages to its operators than in most other cities.

The total number of employes in 1907—6,843—had an average monthly payroll of $43.97. The 8,475 employes in 1911 had an average payroll of $51.31. While the number of em-

(*Continued on page 744.*)

City and Suburban.

Calendar Year.	Total Telephone Earnings.	Expenses of Operation.	Net Telephone Earnings.	Miscellaneous Revenue.	Net Return to average Investment.
1891	51.01%	29.40%	21.61%	.18%	21.79%
1892	42.11	26.02	16.09	.14	16.23
1893	38.23	23.77	14.46	..	14.46
1894	35.83	21.84	13.99	.07	14.06
1895	36.52	23.42	13.10	.43	13.53
1896	37.42	22.05	15.37	.46	15.83
1897	36.92	20.10	16.82	.37	17.19
1898	37.61	21.29	16.32	.28	16.60
1899	36.68	21.85	14.83	.27	15.10
1900	34.39	24.74	9.65	.25	9.90
1901	33.59	21.19	12.40	.27	12.67
1902	33.17	21.50	11.67	.22	11.89
1903	34.54	22.74	11.80	.29	12.09
1904	36.77	21.14	15.63	.35	15.98
1905	37.77	23.40	14.37	.23	14.60
1906	36.67	23.10	13.57	.25	13.82
1907	33.90	26.00	7.90	.22	8.12
1908	29.77	22.95	6.82	.28	7.10
1909	31.40	23.32	8.08	.17	8.25
1910	33.13	23.37	9.76	.13	9.89
1911	33.53	23.76	9.77	.12	9.89
		City.			
1908	31.91%	25.21%	6.70%	.31%	7.01%
1909	33.39	25.34	8.05	.15	8.20
1910	35.00	25.16	9.84	.13	9.97
1911	35.38	25.58	9.80	.13	9.93

Table No. 2. Per Cent. Earnings, Expenses and Net Return to Average Investment, Eliminating Allowance for Depreciation.

The Propagation of High Frequency Along Wires

Some Practical Aspects of High Frequency Multiplex Telephony and Telegraphy—Its Relation to Radio-Telegraphy and Radio-Telephony—Advantages Over Existing Telephone Systems—Reprinted from The Journal of the Franklin Institute—Second Instalment

By John Stone Stone

A duplex system of high frequency telephony with two-way transmission for each station is shown in Fig. 2. Again, the simplest practicable arrangement is shown merely for the purposes of illustration, the com-

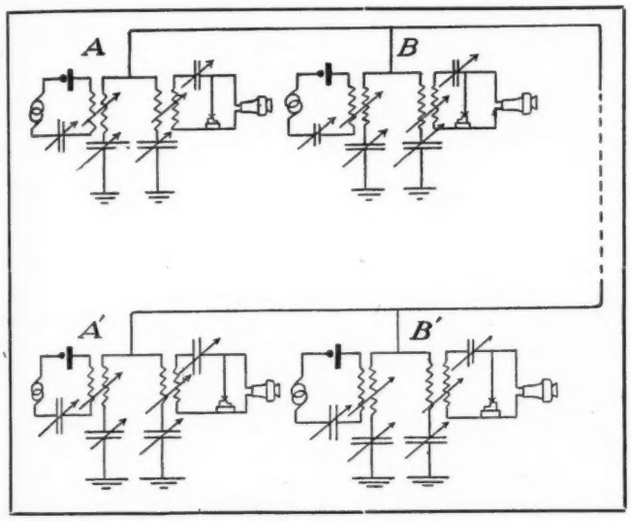


Fig. 2. Duplex System with Two-Way Transmission.

plex but more perfect multiplex station being shown in Fig. 3. Each station of the system shown in Fig. 2 combines a transmitter and receiver identical as to apparatus with the transmitter and receiver shown in Fig. 1, and differing from the simplex system of that figure only in the tuning of the stations. In this duplex system the frequency to which a given receiver is adjusted to respond is as remote as it can conveniently be made from that of the current generated by the transmitter at its own station and from that of the adjacent stations. Thus if stations *A* and *A'* intercommunicate while stations *B* and *B'* intercommunicate, transmitters of *A* and *B* might make use of current of frequencies of, say, 20,000 and 22,000 cycles per second respectively, while the transmitters of stations *A'* and *B'* made use of frequencies of 60,000 and 66,000 cycles per second respectively. Of course, then, the receivers of stations *A* and *B* would be adjusted to respond to currents of 60,000 and 66,000 cycles respectively, while the receivers of stations *A'* and *B'* would be adjusted to respond to currents of 20,000 and 22,000 cycles respectively.

The tuning of the apparatus in the duplex system of Fig. 2, or even of the apparatus of a simplex system with two-way transmission, is not the same as that of the apparatus of the simplex system of Fig. 1, for the reason that in the duplex system and in the two-way transmission simplex system the new element of selectivity is required of the apparatus.

It might not seem necessary in a duplex or multiplex system to make the transmitter circuits selective, since the frequency at a transmitter is completely determined by the generator adjustment or the dynamo speed at that station irrespective of any tuning of its circuits. But on closer examination it will be seen that were a transmitter branch circuit not tuned in such a way as to make it receptive of the current generated at that station and exclusive of currents of other frequencies, currents of all the frequencies used on the line would flow through it. The variations of resistance of the telephone transmitter or manipulation of the telegraph key in the local circuit at that transmitter station would modify not only the amplitude of the current generated at that station, but would also modify the amplitude of the currents of other frequencies as well, and cause "cross talk" between stations on the line not intended to communicate with each other. Each branch, whether it be a transmitter or a receiver branch circuit, is so tuned that it has *per se* that is, when disconnected from the line and short circuited on itself, a minimum of impedance for currents of the frequency it is to select.

The simplest way to accomplish this tuning is to disconnect the branch and local circuit from the line, make the coupling of the coil very small and tune each circuit for a maximum of current by the adjustment of its own condenser. After this preliminary tuning, the coupling may then be increased to any desired extent and the final tuning for maximum current be easily effected. In the case of a receiving station it is in general desirable, in order to secure maximum selectivity, to employ a small coupling, and in tuning the apparatus of a receiving station, the electromotive force is impressed upon the primary circuit. In a transmitter coil it is in general desirable to use a somewhat larger coupling, though maximum coupling is never advantageous. In tuning a trans-

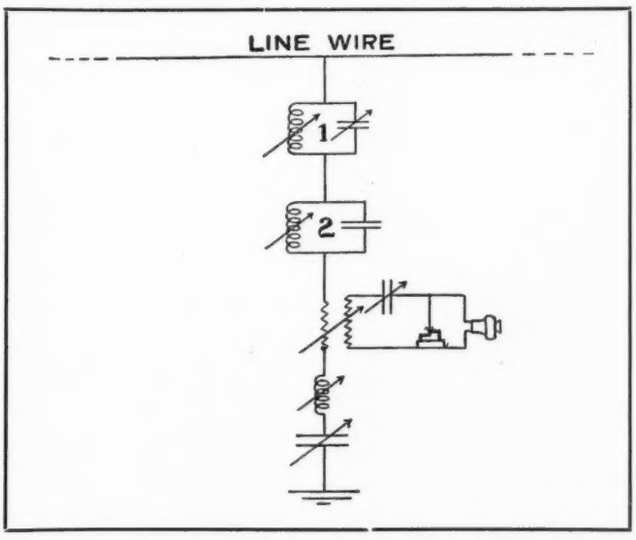


Fig. 3. Circuit of High Frequency Multiplex System.

mitter apparatus the electromotive force should be impressed on the primary for tuning the primary and on the secondary for tuning the secondary. The secondary branch of the transmitter is connected to the line while the primary is being tuned, and is short circuited on the source of electromotive force[13] and the ammeter when being tuned itself.

Of course, the tuning of a primary circuit disturbs the tuning of the associated secondary circuit, and vice versa, and the extent of this disturbance is roughly proportional to the square of the coupling coefficient between the circuits. As a result, the proper tuning of these stations is a matter of successive approximations, but with the small couplings which it is of advantage to use in order to secure a maximum degree of selectivity, two or three successive, alternate adjustments of the condensers in the primary and secondary circuits only are necessary, particularly after one has had some experience in tuning coupled circuits. As these tunings are in the nature of calibrations and are made once for all for a given frequency, they do not appear to constitute a valid objection

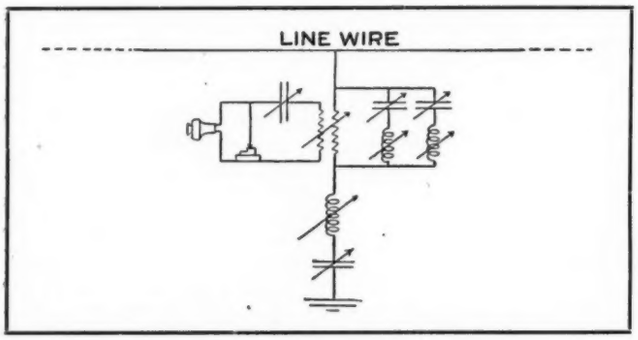


Fig. 4. Arrangement for Centralizing the Energy.

to the system on the ground of their complexity or on the ground that they require special skill.

As already stated, the duplex system illustrated in Fig. 2 is a very simple form of the new system, but serves well to illustrate the general characteristics of a high frequency multiplex system. It lacks, however, a feature the absence of which makes it necessary to choose remotely different frequencies for the use of adjacent transmitters and receivers, a fact which would in many instances, place an arbitrary restriction on the use of wide ranges of frequencies and seriously limit the number of stations which could be simultaneously operated on a single line. The author has devised means which have overcome this difficulty, and three characteristic examples of this means are illustrated in Figs. 3, 4 and 5.

In Fig. 3 the receiver circuit is shown alone, and it is to be noted that in the branch from the line wire, there are two loop circuits, 1 and 2, each consisting simply of a condenser and a coil. These loop circuits are each made resonant *per se* to one of two frequencies, currents of which frequencies it is particularly desired to exclude from the receiver. Thus if this receiver were to be used at stations A or B of Fig. 2, its loop circuits 1 and 2 would be individually made resonant, each to one of the two frequencies generated by the transmitters of stations A and B. If it were used at one of the stations A' or B', its loop circuits would individually be made resonant each to one of the two frequencies generated at the transmitters of stations A' and B'.

The effect of the presence of one of these looped resonant circuits in the receiver branch is practically to make the branch electrically opaque to currents of the frequency to which the loop is made resonant. So great may be made the impedance of such a loop circuit to high frequency currents of that particular frequency to which it is attuned, that it is possible to operate a system in which the receivers are thus protected against the currents from the transmitters at their own station and at adjacent stations with less than 10 per cent. difference between the frequencies of the transmitters and receivers. If the apparent resistance presented by a loop circuit be called R' and the apparent reactance of the loop be called K', then

$$R' = \frac{R}{R^2C^2\omega^2 + (CL\omega^2 - 1)^2}$$

and

$$K' = -L\omega \frac{R^2C/L + (CL\omega^2 - 1)}{R^2C^2\omega^2 + (CL\omega^2 - 1)^2},$$

where R and L are the resistance and inductance respectively of the coil, C is the capacity of the condenser and ω is the periodicity of the current or 2π times the frequency.

When the loop is resonant to the frequency of the current, $CL\omega^2 = 1$, making

$$R' = \frac{L}{CR}$$

and

$$K' = -\frac{1}{C\omega}$$

If in a given case the periodicity be 200,000, corresponding, therefore, to a frequency of 31,850, and if the inductance and resistance of the coil be five millihenrys and one ohm respectively, then the capacity will be 5×10^{-9} farads. In the case of such a loop, therefore, the apparent resistance of the loop to the currents it is designed to obstruct is one megohm, while the apparent reactance of the loop is 1,000.

The presence of these loop resonant circuits in the receiver branches does not interfere with the tuning of the branches to the frequencies to which the latter are required to respond; in fact, the loop resonant circuits assist in such tuning, since for frequencies of currents higher than that, the passage of which a given loop circuit is adjusted to obstruct, the loop presents an apparent inductance with but small apparent resistance. For frequencies of current lower than that, the passage of which it is adjusted to obstruct, the loop presents an apparent inductance reactance with but small apparent resistance. These apparent capacity and inductance resistances are balanced by the adjustable inductance and capacity reactance respectively of the branch so as to make the branch selectively receptive of currents of the desired frequency.

For the currents of a periodicity ω_1, which is n times that to which the loop is made resonant, the apparent resistance and reactance of the loop are:

$$R' = \frac{R}{n^2R^2\frac{C}{L} + (n^2-1)^2}$$

and

$$K' = -nL\omega \frac{R^2\frac{C}{L} + n^2 - 1}{n^2R^2\frac{C}{L} + (n^2-1)^2}$$

In the case of the particular loop circuit just considered

$$R' = R/[10^{-6}n^2 + (n^2-1)^2]$$

and

$$K' = -10^9 n \frac{10^{-6} + n^2 - 1}{10^{-6}n^2 + (n^2-1)^2}$$

If, therefore, in the case of the loop circuit in question, the branch containing it is made responsive to currents of a frequency 10 per cent. different from that of the current which the loop is adjusted to exclude, n is 1.1 or 0.9

(*Continued on page 741.*)

[18]The source of electromotive force must, of course, have its reactance neutralized by a separate condenser when it is used to tune a circuit from which it is to be removed after the tuning is completed.

A Nature Story

Animals and Politics—The Ubiquitous Pig

By J. C. Kelsey

It is the Sunday before election. As I write, I am bewildered by the claims of the campaign managers. As you read these lines, you will know who guessed right.

Elections are like clean baseball games. There is a misunderstood psychology which causes ostensible winners to lose and apparent losers to win.

If baseball were a cut and dried game, there would be no great American crowd watching the game and millions watching the news from the wire. If politics were cut and dried too, there would be the same effect.

Whatever the result, whatever happens in the last half of the ninth innnig, we will go along just the same. Our country is too great to be bothered long by a cramp. Whatever happens, we can breathe once more and enjoy the quiet life of a commercial center.

One thing has shone out in this campaign, as bright as the evening star. Not the unparalleled condition of business all through the campaign, but a sort of a natural history lesson.

Noah's ark certainly furnished the basis of this campaign. The elephant, donkey and moose were constantly paraded before our bewildered eyes. Never before was there such confusion among the animals. But the ark was strong and floated back to land in safety.

I have been wondering what a composite picture of the elephant, donkey and moose would make. I seriously suspect that it would be a lusty pig!

All three animals have very few fierce characteristics, so has the pig. As long as animals are chosen to represent human beings, we may suspect the basic element of selfishness.

The pig is the emblem of this great human weakness, intense selfishness.

As a boy, I had considerable experience with pigs. Between hog cholera and broken fences my life had no cause for ennui.

A pig has a great history—some political party should adopt him. Jews shunned him. They do yet.

Pearls have been cast before him. Even cast-out devils have resided in him.

St. Patrick did not rid Ireland of snakes any more easily than a pig could have done it.

Pigs have a lot to do with our legislative and political history. Even more than the horse which carried Paul Revere and its effects upon the Battle of Lexington. And more than Mrs. O'Leary's cow, whose gentle hoof changed the history of Chicago. And possibly as much as the cackling geese which saved Rome from the hand of the vandal.

Nations are not built up in a day. Our forefathers did not write the constitution impromptu.

Undoubtedly they searched the world for knowledge of a government's care. They eliminated certain things here and added certain things there. They did make a strong constitution and they put a lock on it.

For a few years presidents dared to do a few things. But it was not long before Chief Justice John Marshall had them all bluffed out.

You know that our government has a divided legislative body, so has each state and many cities, too. Each body has the veto power upon the other. Nothing is accomplished unless harmony is prevailing.

In 1644, in the fall, an innocent pig strayed from its pen. Little did the passers-by realize that in that pig, with the wanderlust, was the formative process of our government.

At that time, no one was bothering much about government anyway. They were busy, trying to find something to eat.

This Boston pig belonged to a lady named Sherman, and it was about all she had.

This pig rambled about the poor quarters of the city without finding a resting place. Finally, he found the pigsty of Captain Kean who lived in the aristocratic quarters of Boston.

The captain was fattening one for fall killing and he was not unwilling to allow another to join. Hog-killing time came and the captain, with his own aristocratic hands, butchered what he thought was his own pig.

A year later, Mrs. Sherman, still on the hunt for that precious pig, came upon a trail which led to Captain Kean. She failed to identify the surviving pig, and began suit for the recovery of her property, claiming her pig had been slain.

The elders of the church naturally decided against the woman. They always do. She appealed the case, and a jury in the justice court decided against her.

Then the irate aristocrat sued the poor woman for defaming his fair name, and the same court awarded him forty pounds as a balm for his tender susceptibilities. The lady appealed to the general council and, after seven day's futile and violent argument, they went into hopeless deadlock.

It developed, however, that the silk-stocking element of the court had voted solidly for the captain, while the low-browed section had manfully supported the poor woman.

This caused more fuss, and the low-brows seceded from the court. As a final compromise, the two bodies separated into two houses, each with the veto power upon the other.

History does not say how the suit came out, but it is safe to say it is dragging in the courts yet, so slow is the process of American law.

You remember the story of the lawyer's son who, after graduating from the law school, went into active practice. He settled a long, drawn-out case and hurried over in great glee to inform his father of his success.

His father said, "You foolish boy, that case fed my father's family, sent me to college and has done the same for you; now don't spoil any more cases!"

In our law-making body, originated by a quarrel over a pig, 68 per cent. of its members are lawyers.

We have more laws than all the rest of the world put together. Yet in no case have we ever had a unanimous vote on any point in the supreme court. I mean, a decison involving important political and financial changes.

In this country, farmers lead in numbers. Miners and manufacturers come next. In spite of it all, they and all

other industries have but a 32 per cent. representation in senate and congress.

We are governed entirely by a pitiful minority. We really have no representation at all.

Back in 1776, the country demanded representation if they were to be taxed.

Taxation without representation caused George Washington and others to keep England pretty busy for eight years.

Lucky for us, a LaFayette turned up in good season to take a shot at merry old England.

Had he not done so, the chances are that we would not be worrying about the result of a presidential election, or the fact that lawyers dominate and confuse our laws.

We would have statues of kings and queens in our parks. and possibly a statue of Nelson.

The whole world owes its present form to a series of accidents as trivial as the quacking of ducks or the cackling of geese.

An accident to Russia's wireless apparatus exposed her fleet to the full force of the Japanese war vessels.

An accident put Napoleon out of business, and put a stop to his plans of conquering the world. I never heard until the other day that Napoleon was an epileptic and a chronic sufferer.

An accidental speech robbed Blaine of the presidency.

In every event of importance in this world, no one can predict what process of nature is at work to upset plans of human beings.

Most plans of human beings are based upon selfishness.

A high protective tariff is based upon the selfishness of a few beneficiaries.

Free trade is based upon the best interest of its beneficiaries.

Prohibition is naturally advocated by those who do not drink. And the saloon by those who make a living out of it.

Every man, woman and child is going to do what the pig does, empty the trough on the sly or rudely push the weaker ones away.

I like the general idea of social justice and equal opportunities to every person. But social justice as advocated by professional sociologists is just as selfish as any salesman selling his wares.

Professional sociologists thrive upon the present conditions. They are morbid and work for no real reform.

I have heard people say that child labor should be done away with. But they propose no practical substitute for the lack of work or the need of support.

The American father does not care to make his children get out and work for him.

The immigrants count each child an asset. They put them to work. They have to. No foreigner in Chicago can support a growing family with the work he can do or get to do with a shovel.

When one supports the idea of large families, he should advocate the idea of a government bounty or free transportation, etc. When one supports the idea of sending the poor people to the land, they should have a way provided for the transportation to the land, and money for the purchase of the land, too.

The idea of equal opportunity is a vague one.

Two boys grow up in a country town. Both leave for large cities.

In twenty years one is a successful business man and the other a dissatisfied failure.

Both left home with equal education and training, and equal health. Neither one had any friend with any sort of influence. Yet one succeeds and the other fails. And worse yet, five succeed where ninety-five fail. Is it selfishness?

No young man could start out today and be an oil king. Nor could he be the wonder of life insurance in a few short years.

These things are tied up pretty tight. Yet today there is greater average oportunity than ever before.

I have heard men sneer at the suggestion of companies looking for $25,000 men. Yet these places really exist.

I have run into these $25,000 beauties and have never been impressed with their strength. Yet they must have a certain or peculiar kind of strength to make them valuable.

Some corporations want men with initiative, others do not. It seems sometimes as if most men are denied initiative, or at least are bound by a selfish policy.

Big salaries in big corporations are usually scarce. As a rule the salaries are small. They have to be, for organization makes puppets and kills initiative.

The psychology of commercial success will always be as much of a mystery as a winning ball club.

Millions of men have had opportunities and have failed.

Social justice and equal opportunity will fail unless human nature can be changed.

Just as a wandering pig had its effect upon a great government, so has some trifling incident changed men's lives. Today there are ever so many men who have been successes, who have been turned out of corporations to make room for others.

Just as a man is about to reap the reward of his industry, the old management becomes extinct; he has to make way for the new.

The old story of the Pharaoh who knew not Joseph, applies equally to conditions today. No man can build upon any hopeful foundation in a corporation.

The new generation has no use for the human equipment of the old.

In our Independent telephone we have a fine case at Green Bay and Appleton, Wisconsin. As long as the organizers lived, the company thrived and the employes were happily building up a future.

The new generation needed the money.

The property was sold at a sacrifice, and the old, faithful employes were ruthlessly sacrificed. Pigs, again!

I know a very successful man in New York who saw his life-work spoiled and his chances for future advancement killed by a change in the generation.

He had the courage to make a change without force, and he has shown what has to be done and can be done very, very often in our country.

When a new railway president steps into the office of the old president, he sees the resignations of all the old president's followers. It is a sad condition of affairs when the rank and file of a railroad has to be changed from president down. It does more to make railroads have accidents and disasters than anything else.

Railroading, to be successful, must be handled by men with good railroad habits. Every engineer should know every curve from habit of thought. And every trainman guards his train most successfully when he has the road habit.

It takes three generations to make a railroad man. That is why English roads have so few wrecks; they don't change so rapidly.

I know of one railroad that barely earns monthly bond interest.

It has a president who gives it one day a month and gets $25,000. On that day, a private car with a great force of assistants, costing the road several hundred dollars per day, rolls into the yards for a big force of men to look at, who have been laid off so that the bond interest could be paid.

The people who own these bonds think they have good ones. They are mistaken. A coupon which rests its hopes of payment upon the lay-off of switchmen, brakemen and section men is a dangerous element.

There is so much "pig" in our big finance, the necessity for keeping up appearances when ties are rotting and rails rusting.

There is no social justice which will lay off laboring men, and at the same time pay a man $25,000 a year for twelve days' work!

Any "pig" finance which starves men's bodies and souls is going to hell. That is sure. The world is bent upon getting square and straight, although the process is awfully slow.

The public is a queer institution. It will listen to an increase in the price of meat and produce without a groan. But let a telephone company try to get just returns by a little raise of $3 per year and there is a howl.

Possibly it is because the telephone business is different. We have at least been taught so, anyway.

If any business on earth has the necessity of being forgiven for past piggishness, it is the telephone. But the telephone has not been forgiven.

If you will read the daily telephone news, you will see a revolt nearly everywhere which, if not abated, will spread into another telephone movement.

The public wants service, but it does not want to pay for it.

The public has predominating selfish characteristics, and its emblem should be the pig!

MORAL: Neither pigs nor the public are ever satisfied.

New York Company Announces Bonus Plan for Operators.

The New York Telephone Co. has adopted a plan in New York City for making additional payments to operators who remain in the service two years or more. All classes of operators, day and night, chief operators, assistant chief operators and supervisors—are included. The increased wages and bonuses for these employes will cost the company approximately $250,000 annually. The company has announced that bonuses will be paid for continuous service as follows: $25 at the end of two years; $50 at the end of each year from the third to the ninth year's continuous service; $100 at the end of the tenth year and for each successive year thereafter. Beginners or student operators who are paid a small salary while attending the company's school for operators will also have their pay increased $1 per week.

This increase will affect all classes of operators, day and night, from the chief operators down. It is not yet known just how many operators will receive bonuses under this scheme, but it is estimated that the increase in the pay of operators will amount to approximately a quarter of million dollars per annum.

The work of the telephone girl is being made more pleasant and more remunerative constantly. In December, 1910 the company shortened the working hours for day and night operators from nine to eight hours, and for the evening operators from eight to seven hours. At the same time the wage scale was increased. The decrease in the working hours made it necesasry to add 800 new operators, and increased the salary expense about $425,000.

New Illinois District Association.

At a meeting of representatives of seventeen central Illinois Independent telephone companies, held in the rooms of the Chamber of Commerce, in Decatur, recently, a permanent organization was formed to be known as the Central Illinois Independent Telephone Association.

Officers were elected as follows: President, E. A. Purcell, Taylorville; vice-president, Dr. Oscar Yarnell, Decatur; secretary, D. E. Converse, Decatur; treasurer, Dr. J. W. Collins, Decatur. The executive committee consists of Messrs. Purcell, Converse and Collins.

It was decided to incorporate the new organization under the laws of Illinois. New members will be taken in at any time. The meetings are to be held quarterly.

The new organization will work for the mutual benefit and service of the lines represented in its membership. The territory covered lies west of Springfield, north to Clinton and south to Pana.

Bell Company Discontinues Exchange in New York.

The Bell telephone company recently discontinued its telephone exchange in Prattsburg, N. Y., and now maintains simply a pay station there.

The Prattsburg Overland Telephone Co. (Independent) has been operating in Prattsburg for the past ten years and has upwards of 1.000 subscribers in Prattsburg and vicinity. The company was originally started by L. H. Conine of Prattsburg, who constructed several single wire grounded line rural circuits in and about Prattsburg, Avoca, Wallace, Wheeler and Kanona some 12 years ago. Since then the development has been healthy and steady and now practically every highway in that section is covered by Independent lines.

F. W. Ives is manager of the Prattsburg Overland company's plant at Prattsburg and is giving to the public a telephone service which is very satisfactory.

New York Independent Makes Progress.

Good progress is being made in the construction of the Independent telephone line in Niverville and North Chatham, N. Y. It is expected that the wires will be strung as far as Nassau before cold weather. Dissatisfaction with the Bell service led the residents of this territory in the early part of last summer, to organize a co-operative company which, when ready for business, will have a large list of subscribers in towns in southern Renssaelaer county.

Improvements for Louisiana Company.

The Shreveport Home Telephone Co., Shreveport, La., has just closed a contract with the American Automatic Telephone Co., of Urbana, Ohio, for the installation of that company's automatic apparatus at the West Shreveport exchange. The work will be rushed to completion and it is expected that the new service will be given by the first of the year.

This will also involve the construction of a new exchange building. Henry L. Dillon, manager of the Shreveport Home, has a number of other improvements under way which will be announced later.

To Lay Conduit in Pennsylvania City.

The Bell Telephone Co., of Fennsylvania, will place 14.000 ft. of conduit in Easton, Pa., this year. More than 30,000 ft. of 25 to 300 pair cable will be laid. The construction work will replace 26,000 ft. of aerial cable and 88 miles of open wire.

The Telephone Inspector and the Troubleman

The Ninth Installment of a Series of Articles Which Deals in an Elementary Manner With Many of the Problems Encountered in the Operation of Small Exchanges—Some Pointers on Pole Line Construction—A Pole Derrick

By A. E. Dobbs

"By the way," asked George, after they started on the return trip to town, "did those men I hired yesterday for framing poles show up this morning?"

"Yes, they came about five minutes after you left," replied the manager, "and I set them to work in the pole yard. From the way they began work I judge they must have about 80 done by this time."

"Now what does he mean by 'framing poles'?" asked Will of Tom.

"Pointing the tops, cutting gains for the cross arms and boring holes for the bolts," he replied.

"Can you find some men to dig pole holes tomorrow morning?" asked George of Mr. Risk.

"Yes, I think so. Farm work is nearly over and I had three men apply for work today."

"Better set them to work in the morning digging holes. We have about five miles of stakes set already," said George; "and as soon as they have 15 or 20 holes dug we can get a team to distribute the poles. Then they can begin setting them so that the holes will not fill up if it

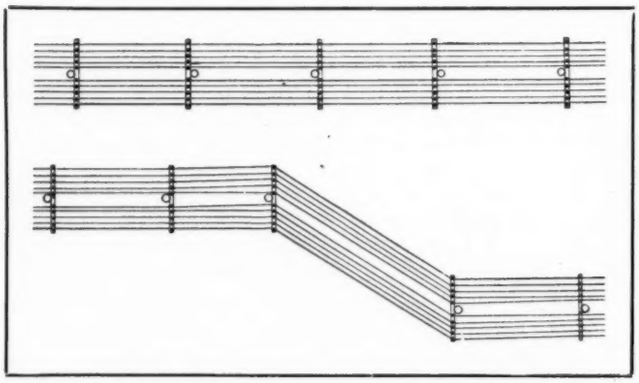


Fig. 13. Facing of Cross Arms on Straight Lines.

should happen to rain, as well as keeping people or animals from falling into them. Better detail Johnston for that job. If necessary I will send William back to clear trouble, as I wish to keep ahead with this survey until it is finished."

"Johnston," said George the next morning, addressing the boss of the "ground hogs," "make those diggers put the holes down to the proper depth. You know that if you don't watch those groundmen, they will stop digging when the hole is three feet deep. I had much rather have you dig a hole six inches too deep than six inches too shallow. Here are the specifications which I will read so we can discuss any points that are not clear.

Length of poles.	Depth.
20 ft.	4 ft.
25 ft.	5 ft.
30 ft.	5½ ft.
35 to 40 ft.	6 ft.
45 ft.	6½ ft.
50 and 55 ft.	7 ft.

Where curves are encountered, the poles should be set six inches deeper. Holes must be large enough to allow of hard tamping all around the pole. In filling holes, there must be from two to three tampers to one slow shoveler and the earth packed hard.

Cross arms on out of town poles shall be faced alternately forward and back as shown in the blue print (Fig. 13).

Where soft ground or quicksand is encountered, it may become necessary to set a barrel in the hole and fill it with broken stone packed hard, or with concrete, consisting of one part cement, two parts sand and five parts coarse gravel or broken stone. At such places the superintendent

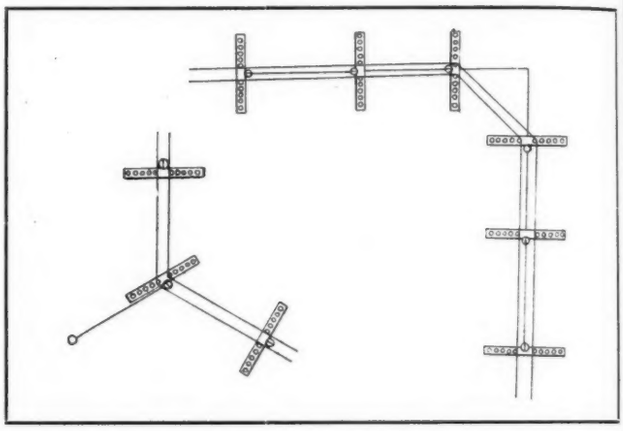


Fig. 14. Guys and Facing of Cross Arms at Corners.

will decide upon the method to be employed after a personal investigation.

All poles to be set perpendicularly with cross arms at right angles to the direction of the line except at corners where the arms shall be turned toward the apex of the angle. These are shown by the blue prints (Figs. 14, 15 and 16).

All guy stubs shall be set in the ground to a depth of six feet and shall be set so as to lean away from the pole which is guyed to them. This construction is also shown in the blue prints (Fig. 17).

All anchor logs shall be at least eight inches in diameter and five feet long and set to a depth of not less than six feet.

"What is the use of putting in that item about tamping rocks around the pole in soft ground," queried the man-

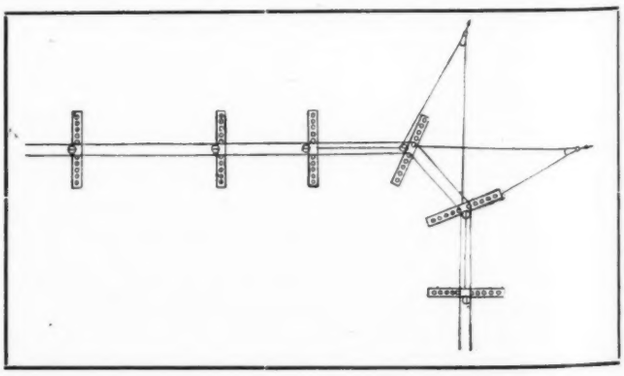


Fig. 15. Corner Guying on Heavy Lead.

ager, "don't you know that where you have swamp land or quicksand, there will not be a rock bigger than a gravel stone within five miles at the very least? A mile above where you quit last night we strike Buck Creek, where we will have to set about six poles across a muddy and

sandy bottom, with some quicksand, and we have no rocks that we can get at or any coarse gravel, but that we will have to haul at least six miles."

"Why, there is a bluff just the other side of the creek where a ledge of rock crops out," answered George.

"Yes, I looked at that ledge. The top soil covers it two

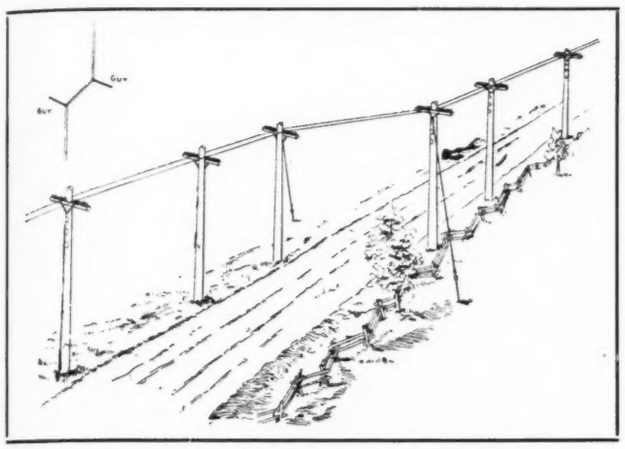


Fig. 16. Road Crossing for Light Line.

feet deep, while to pry loose as much rock as we need for that filling, will take a man about two days, besides we would have to pay for the right to dig them out. Now Jenkins, who lives near town, has a pasture full of "nigger-heads" that he would only be too glad to have us pick out and carry away, but it would take us a day and a half to haul them and half a day to pick them up, so that those loose stones would cost as much as cement."

"Now, could we not save that expense by anchor guying those poles on both sides to keep them straight?"

"As Mr. Wilson seems to have nothing to say just at present, suppose we figure comparative costs," said Johnston.

"That's right," rejoined Mr. Risk, "for, although I leave these questions for Mr. Wilson to decide, I like to get all the ideas I can and after all, this is a sort of family consultation."

"Well, as to rocks, our expense would be about as follows:"

Hauling rocks, two days	$6.00
Barrels.	1.00
Extra time digging large holes	1.00
Total.	$8.00

Now as to cement:

Three bags cement	$3.00
Sand and gravel at pit	.25
Screening sand and gravel	.25
Hauling two loads	3.00
Mixing.	1.00
Barrels and extra digging	2.00
Total.	$9.50

"The side guys you spoke of would cost about a dollar a pole or $6 in all. That would be the cheapest plan, but it is open to the objection that the guys would have to extend into the field on one side and the road ditch on the other."

"I have succeeded in developing an idea," spoke up George, who had been in a brown study, "that I think is more feasible than any of the others. We have in the yard, some poles with five-inch tops, which we have been saving for farmers' lines and which we could not use on this toll line. The plan I suggest, while not new in some places, has never been put to use to any extent in this part of the country. It is a double pole line.

"Here is the idea," he continued, hastily drawing a sketch (Fig. 18). "It consists of two poles four or five feet apart at the base and leaning towards each other at the top. Such a line would be rigid in construction; would be proof against floods and storms, and would not endanger either a jagged farmer or his live stock while, no matter how soft the ground might become, it would not lean over. We would not have to dig extra large holes beyond setting them six inches deeper than the ordinary poles.

"Now, as to the cost:

6 extra poles.	$7.50
6 extra holes.	.50
Extra time framing.	.50
Hauling.	.75
Total.	$9.25

"We must not forget, however, that there is a bluff the other side of the creek and that we must rise to meet it with a 30-ft. pole this side of the creek in order to prevent too abrupt a rise. This will add about two dollars to the estimate as against about half that amount for single pole construction.

"Why could not the poles be brought together at the top?" asked Will.

"Because, it is hard to bevel them accurately and it would be harder to replace a pole if it ever became necessary," replied George.

"The plan looks good to me," remarked Johnston.

"It meets the situation," decided the manager.

"Then it stands approved," said George.

"Mr. Wilson," said the manager, as he and George were riding ahead after leaving the diggers along the road. "You seem to be quite ingenious. You introduced post hole diggers on this job instead of the time honored digging bar and spoon and the result is that we can now dig about twice as many holes with the same gang as we did before. Now can you invent some kind of a wagon derrick that will enable the teamster with the help of one or two men to throw those poles into the holes as fast as he unloads them? If you can, it will enable us to put the arms on the poles before we raise them, which will not only be a great saving in time but a great help in lining them up. By the way, I think we had better put on two arms until we reach the cross roads, five miles above here."

"Are there not such contrivances on the market already?" questioned George.

"I cannot find them advertised. But there are two

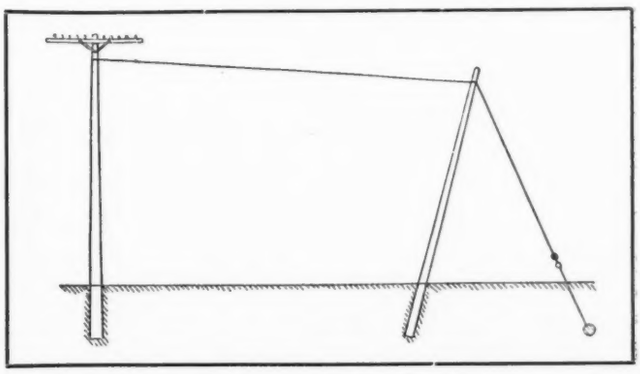


Fig. 17. The Guy Stub and Anchor.

reasons why we should construct our own; one is, that we want it right away for this job, and another is that I think we can save some money by building it ourselves. I might as well add another reason, which is that, as the people of our town are supporting us, we should co

tribute to their support whenever possible, if we can obtain reasonable prices."

"I do not think you will save much time by that scheme," said George, "but it will put the poles in the holes as we go along, thereby not only protecting the holes but avoid-

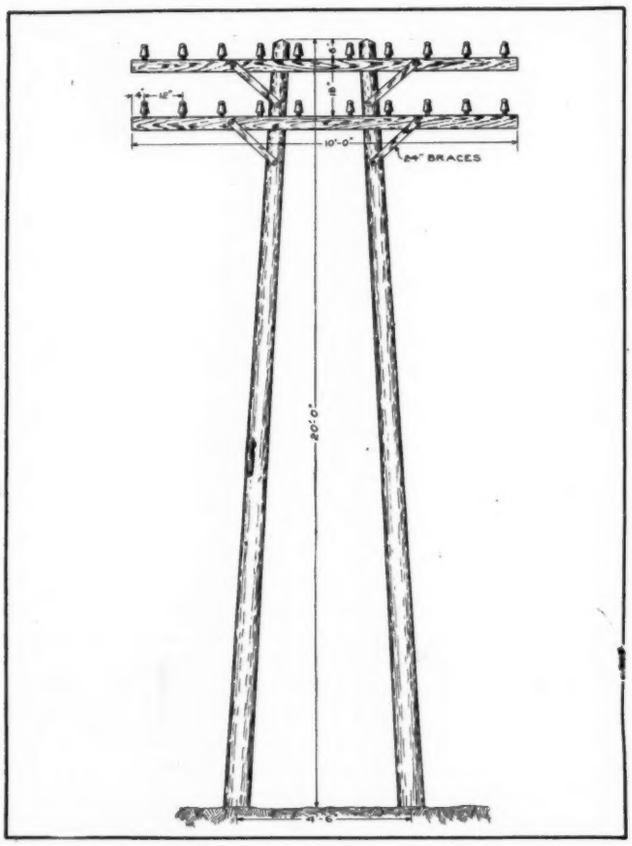


Fig. 18. The "A" Pole Line Construction.

ing a certain amount of risk that always goes with piking them in. Then, when the gang comes along and straightens them up, the arms are on and the pole work done. Now, let us see:

"The device must be cheap."

"And good," added Mr. Risk. "We have no large machine shop here, so there must be no special castings or anything that cannot be made down at the local wagon or blacksmith shop. It must also be easily carried on a wagon and be capable of lifting a 35-foot pole.."

"Here," spoke up George, producing a sketch (Fig. 19), after some minutes, "is the outline for a derrick that is not perfect by any means, but it will enable us to make fast time in setting those poles. The device can be made in a day by almost any blacksmith, with the exception of the top wheel, which must be cast at the foundry unless we can find what we want at the junk shop."

"The boom consists of a 4 in. x 4 in. oak stick 13 or 14 ft. in length. At the top is a wheel held by a loop strap that extends 18 in. down the sides. The bottom is fastened to the rear axle of the wagon by means of two 3 in. x 4 in. angle irons through which a bolt passes. At the top are also two rings for side guy attachments which may be hooked into the front wheels. There is no side motion to this derrick so that the wagon must be backed up to every hole but the boom will allow of four or five feet of swing for the pole.

"When the wagon is backed up, the hook at the lower end of the lower block is fastened to a sling that passes twice 'round the pole about 12 feet from the ground, or just above the center of gravity. Two men at the end of the rope can pull the pole up, while a third guides it into the hole. Then the men on the rope slack down slowly and give a pull on the small rope attached to the hook. This pulls it out of the sling which released drops to the ground and the wagon moves on. The wagon must have a stiff middle pole and if the derrick pole is very heavy, it may become necessary to load the wagon down in front.

"This pole raising device can be loaded on the wagon. As the teamster drives out, he unloads his poles along the route. When the last pole is distributed he attaches this gin pole. Then he drives back toward town, throwing in the poles he has unloaded. After raising the last pole it is left to be picked up as the driver comes out with another load. He attaches it to the rear of the wagon and drags it along, except that the wheel at the end prevents its dragging. The performance is then repeated."

"Wouldn't a smaller wheel on top answer just as well," questioned the manager.

"Yes," replied George, "but a large wheel runs easier and I also had in mind trailing the derrick along after the wagon. If the wheel has to be cast in the foundry here, I should advise you to have it made smaller."

"That is a blasted home-made contrivance," muttered George to himself as soon as he was alone, "but it was the only

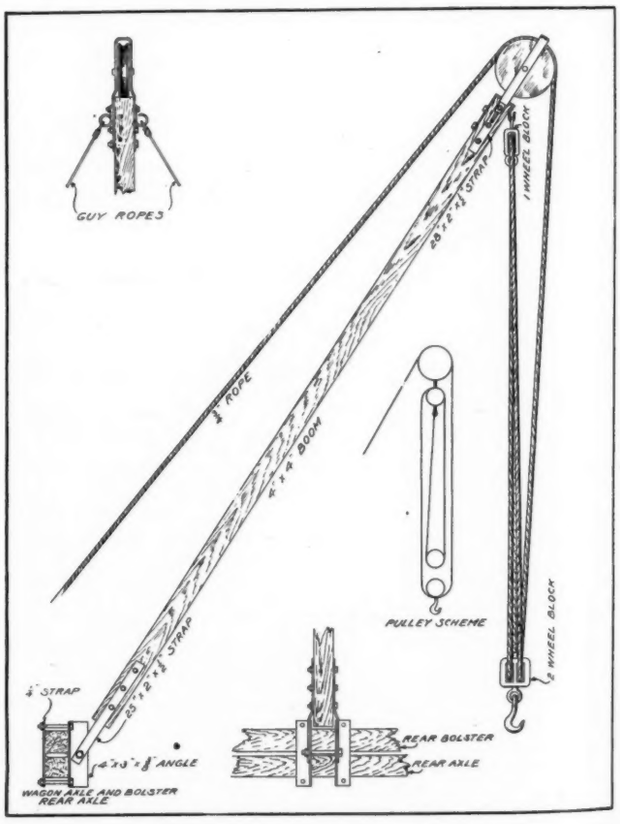


Fig. 19. The Pole Raising Derrick.

thing that would meet the case and I hope it works well. I am not a mechanical engineer anyway. Next he will want me to build an airship to hunt trouble with."

(To be continued.)

Annual Reunion of Telephone Pioneers of America.

Great plans are being made for the second annual reunion of the Telephone Pioneers of America, to be held at Hotel Astor, New York City, November 14 and 15.

The general committee in charge of the reunion consists of Howard F. Thurber, Gerald Swope, Henry S. Brooks, Angus S. Hibbard, Henry W. Pope.

Department of Railway Telephony

The Seventh of a Series of Articles on Telephone Train Dispatching Takes Up the Question of the Protection of Railway Telephone Equipment Against Lightning and Stray Currents—The Value of a Good Ground

Protection of Dispatching Equipment.

By John A. Kick.

The type of lightning arrester and its location have given rise to much discussion. It is continually pointed out that commercial telephone authorities agree that the fuse must be next to the line, irrespective of the type of arrester. While this is desirable in standard long distance and exchange service, both commercial and railway, I do not agree that is practical in railway dispatching and message service. In fact, it has been proven impossible where continuous service is demanded.

The light capacity fuse next to the line serves as a double protection in standard telephone work, in that it furnishes both lightning and sneak current protection and is of such capacity as to "blow" on very low currents. The blowing of a fuse on one of these circuits does not prove of such importance that a few minutes' delay will be felt. In fact, where it is important as on long distance telephone lines a man is usually at hand and makes replacement at once.

On railway dispatching circuits, ten minutes' or more delay, often much less, is a serious handicap in handling trains or important telegrams. Continuous service is demanded with the result that a light capacity fuse next to or in the line at way stations proves impracticable. With a selective bridge across the circuit at each station and the fuses next to the line, the selector is not really safe from damage until both fuses are blown. Until then, the selector circuit provides a high resistance path around an air gap, Should the arrester be slightly defective on one side, the selector runs a good chance of damage. With the very light equipment fuses back of the arrester, the first blown fuse opens the selector and telephone circuit from further possibilities of trouble. With the two methods namely first, a low capacity fuse installed ahead of the arrester and second, the same capacity fuse placed back of the arrester, there will be in the first case destroyed selectors, condensers, cords, receivers and other damage, while with the second arrangement very little or no damage and, strange to say, not many blown fuses.

The blowing of fuses in way stations is most serious when the fuses are in the line as it cuts off the entire circuit beyond the station. While it is desirable that the line be fused at way station test panels, it has been found that a compartively high capacity fuse can be used with safety. It avoids both the unnecessary interruptions and at the same time furnishes protection against excessive currents. For the purpose of protection against sneak currents, it is possible to place fuses of say 10 ampere capacity ahead of the arrester and equipment fuses of one ampere capacity back of the arrester. However, the demand for the first fuse, except where it is in the line wire for protection of test panels, is to some extent questionable, although there is no gainsaying, that it is an added factor on the side of safety.

There is a very acceptable explanation of the difference in protection required by commercial telephone circuits and those of dispatching service. A commercial circuit is fused and protected by arresters at two or three points in a distance of say 100 miles, while the usual dispatcher's circuit is furnished with 20 to 30 protectors in the same length of line. As there is practically no limitation in mounting space, an arrester with greater surface which furnishes more effective protection, is used:

I have often watched the arresters in long distance telephone offices. It has been my experience that the fireworks display there was a class of its own, when compared with the standard arrester used in railway dispatching service. The reason was that the discharge was forced to pass through the two arresters at the terminals, while on the dispatching line, it is dissipated through 40 or 50 arresters distributed at various points along the circuit.

Telephones placed in pole boxes and booths for the use of trainmen should be protected by lightning arresters and fuses to prevent loss of, and damage to equipment and also to protect the user.

This class of equipment does not receive the best of treatment nor does it always get the very best maintenance attention although it is in a class that should, as no one is accountable for damage and careless handling. It should therefore be provided with an automatic cut out switch to keep the instrument from being permanently across the line.

There are several types of carbon block arresters which provide a reasonable amount of protection but the vacuum type of arrester is without question the proper form. The vacuum arrester gives protection with less maintenance attention than does any other effective arrester. While this form of arrester is yet too new in the service for the user to arrive at a definite figure of service life in full efficiency, yet some comparative service data has been secured to use for a basis in comparing maintenance costs.

The vacuum arrester gives practically no trouble by reason of dislodged particles between carbons causing leaks to ground; is easily tested; and with the improved non-destructible enclosures, the maintenance should be a minimum with a maximum efficiency.

Fuses should be of the enclosed type in such receptacles as to be replaced without danger. In fact, both arresters and fuses should be so assembled that they can be replaced during storms without fear of injury to the attendant.

It appears rather out of proportion to pay 25 to 50 per cent. for the protection of apparatus. It might be a good hazard to entirely neglect the protection if it were solely a question of the loss of equipment, but the most serious objection is possible fire losses and personal injury. When all is considered the highest class of protection is an excellent insurance at a minimum rate and there is not a single installation where such insurance is not justified.

Not enough attention is given to providing good grounds on arresters and it is the writer's experience that 75 per cent. of the telegraph office grounds are poor and have to be renewed for effective service in telephone work.

The old practice of tying a wire to a piece of railroad iron and throwing it under the depot platform (an actual discovery) will no longer serve, neither will the tying onto a many legged wire which is said to go to ground somewhere. There should be a good substantial ground rod that reaches a permanent moisture level. It should be well soldered to a heavy copper wire which leads direct to the equipment with the fewest number of turns and absolutely no direct sharp bends.

Where it is impossible to secure a suitable ground through the use of a rod, it is then necessary to use a copper plate and charcoal or a ground cone. The point I wish to make is not the means of securing a ground, but rather the necessity of a good ground, a point which is often overlooked. Protection then means high efficiency arresters, balanced capacity fuses, a proper circuit relation of the units and a perfect ground connection.

Sparks from the Troubleman's Department

Crossed Wires Didn't Stop Him.

This is George Henry Smith of Cedar Grove, N. J. This The Sun? All right, take this down. Squire Hezekiah Baldwin has built an airship trap in his back yard—

(Petulant voice: "Now, Central, you know I asked for Metuchen 44, party J, and you've given me Melrose 48, party R. Get off what wire? I'm a what? You'll what?")

Now we're all right again. And the Squire invited the local board of poultry trade up to his house today—

(Soggy voice: "An' what I wants to know is this, if I ain't in Jack's, where am I?")

Let's see, where were we? Oh, yes. And when they came he showed them his invention, which is to hitch a rope to a carrier pigeon—

(Feminine voice: "I says now you go on and sell your lace curtings; you had ought to be ashamed of yourself,

ANXIOUS MOMENTS

Copyright, 1912, by Henry Barrett Chamberlin.

you had, pulling that stuff on a re-fined lady, and with that I reaches out and—")

And the carrier pigeon is set loose whenever an airship comes over Cedar Grove—

(Official voice: "Five cents, please.")

Oh, central, reverse the charge, will you? And the Squire has hold of one end of that rope—

(Foreign voice: "For what is it he done that to me? Am I a bad friend of his ever? Who was it paid the rent the last time when—")

And he has trained the pigeons to fly over the aeroplane and then turn and fly beneath them—

(Tough voice: "You get the gate, see? Horrid Harriet and Coriolanus the Cheese will be waiting for you on the corner in a taxi in front of the hogshead of Gore.")

And so they get the aeroplane all snarled up and then the Squire he pulls on the string—

(Servitor's voice: "When he blows the whistle drop a hash plate and walk out, balancing a fork on your nose. This is the signal.")

And down comes the pigeon and the aeroplane—

(Distressful voice: "But, doctor, he's all red over his po'ar little chest and John says—")

And there you are. Just a minute. The Cedar Grove board of poultry trade when interviewed today were unanimous in their opinion that the scheme is—

(Squeaky voice: "Yes, this is Mr. Buttonbeazer—Mr. Percival L. Buttonbeazer, Jr. Oh, you've got the wrong number; you want Woodycrest 8 F, ring three J.")

Impracticable. Good night.—New York Sun.

Help! Help!

Poetry will out, sometimes in the most unexpected places and occasionally from unusual sources, says the Los Angeles (Cal.) Times. One of the latest devotees of the muse and one who has been creating considerable comment around the Alexandria is little Miss Vivian Ewing, Postal Telegraph operator in the hotel. After months of viccisitudes and troubles caused principally by the patrons of the little station in the marble corridor, Miss Ewing evolved the following prayer to assist her through her hours of toil:

Help me this day, O, Lord, to be
Kind and gentle with my key.
Help me earn my wage this day
And tempt me not to ask more pay;
And if some man who sounds insane
Should move me to hot words profane,
O, stay my hand upon the key
And may I not make "H" for "P".

May I refrain to open my door
And kick through it a weary bore
Who brings to me his darling "kid"
To be transformed into a "lid".
And may I gently treat the cranks
Who, after spoiling twenty blanks,
Fold up a lot of callow slush
And sternly bid me, "send it rush".

And when the clock points five to eight,
O, help me then to calmly wait
While some proud dad leans on the booth
And wires baby has a tooth.
In short, pray make me what I ain't,
An understudy of a saint,
That I may hold this job of mine
Till time gives me the "30" sign.

C. A. Shock, of Sherman, Texas, sent this to TELEPHONY with the suggestion that variations might be rung on it to make it apply to the telephone operator. So, "potes," sharpen pencils and have at it!

We need a telephone because we daily have to call
To tell pa he is due at home, or he'd not come at all.
—Dallas News.

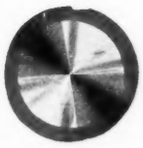
A pay-station operator who is stationed at one of the Milwaukee hotels, and whom Dame Nature presented with an abundance of "sun kisses," or freckles, was trying to put through a Chicago call for a son of Israel, who, while waiting, noticed the sun kisses, and asked, "Did you ever sing that song entitled 'Freckle Face?'" The alert operator smilingly answered, "No, sir, I did not, but I have often sung 'That Yiddish Rag!'"—Bell Telephone News.

Copper Clad Steel Wire is not a panacea for all ills—and we find some conditions for which we do not recommend its use.

But—in its place and that place for you is your local toll line, subscribers' connections, ground rods, tie wires and cable hangers.

It will effect tremendous saving and insure greater efficiency.

A pamphlet describing its manufacture and application has just been issued and will be mailed upon request.



Trade Mark "Weld Clad"

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853 Peoples Gas Bldg.

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CHASE TRUCKS

Solve Your Repair Service Problems

6 Models—500 to 4,000 lbs. Capacity. All Styles of Bodies

No telephone company can afford to be without motor delivery service today.

The Chase truck has long since demonstrated its tremendous efficiency, economy and simplicity. It is the ideal service vehicle for line repair work.

Used by leading companies including Bell Telephone Co., Postal Telegraph-Cable Co., and New England Telephone & Telegraph Co. Let us know your needs.

CHASE MOTOR TRUCK COMPANY

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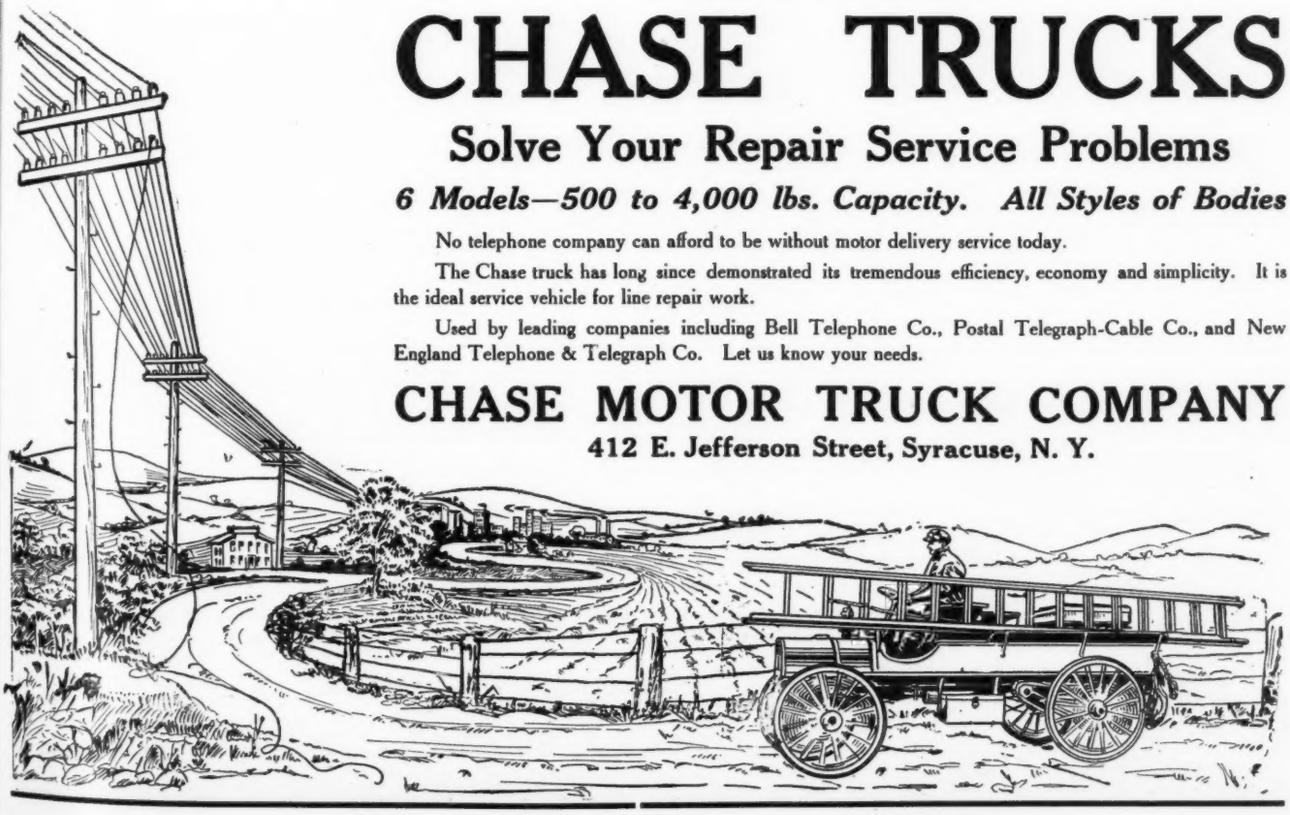

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MILLIONS Of Dry Cells Are Handled In This Territory

FRENCH Telephone Cells

Are Manufactured and Shipped

Direct from Madison, Wis.

There is no reason why the dry cells *you* use should get old in transportation and stock rooms before you install them.

Your orders will be shipped the day received.

Send for new price schedule.

FRENCH BATTERY & CARBON CO.
Madison, Wis.

We Pay Your Repair Bills

Rather a startling statement, isn't it?

Let us tell you about it.

We have such positive knowledge that Chicago Telephones are trouble proof that we bind ourselves legally to pay all repair expense. We pay not only for materials required, but also for the time and expenses of your trouble man while he is going to and from the telephone, and while he is making the repair.

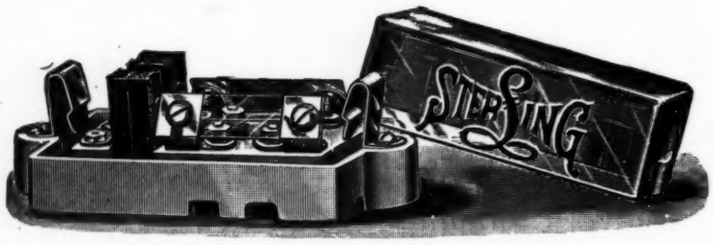
If the telephone is ten miles from your Exchange this expense item might be greater than the price of the telephone. We can afford to do this because the percentage of Chicago Telephones that ever need attention is negligible. During the year ending July 1, 1912, with six hundred thousand telephones in use, this trouble insurance cost us only $274.00.

No other telephone factory dares to duplicate this repair service because no other telephone is good enough to justify it.

Write for booklet entitled "Making Good."

Chicago Telephone Supply Co.
Makers of Telephones and Switchboards
Elkhart, Indiana, U.S.A.

No. 253 Our Popular Sub-Station Protector



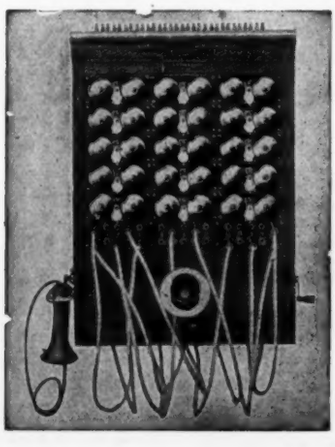
Has all the desirable features of the larger and high priced protectors, and the advantage of being economical both in first cost and in maintenance.

Equipped with 2 inch Postal Type **Renewable Fuses,** and carbon blocks with large ground surface. All connections for line, ground and interior wires are made under lock nuts and washers, and all being protected by a glazed porcelain base with a clear glass cover.

Not a cheap protector, but a good one at a reasonable price.

Other protectors and terminals described in our Bulletin No. 3, which is yours for the asking.

Lafayette Electric & Mfg. Company - - Lafayette, Indiana, U. S. A.



The Andrae Switchboard No. 110 is Troubleproof and Efficient

This is the perfect board for rural line use, It has all the superior features of our larger boards including a special heavy 5-bar switchboard generator, adjustable long distance transmitter, long distance receiver with operator's cord and plug, duplicate jacks with indicating bells. One extra pair of connecting cords and plugs furnished with each five bells. This is a very convenient and popular little board and is highly indorsed by managers of rural lines throughout the United States. It is first class in every respect and guaranteed electrically and mechanically perfect.

It is made to stand much hard use and to give economical and satisfactory service without any trouble. Write today for full particulars of the Andrae Switchboard No. 110.

JULIUS ANDRAE & SONS CO., 358 Broadway, Milwaukee, Wis.

Please tell the Advertiser you saw his Announcement in TELEPHONY.

PROPAGATION OF HIGH FREQUENCY.

(*Continued from page 732.*)

and the apparent resistance of the loop to currents of this frequency is 22.7 or 27.7 ohms, depending on whether the frequency of the current to be excluded is lower or higher, respectively, than the frequency of that to which the branch is attuned to respond.

If the current to be excluded is of the higher frequency, then the apparent reactance of the loop in the branch is an inductance reactance of 4740 ohms, while if it be the lower frequency, the apparent reactance of the loop is a capacity reactance of 5240 ohms. In place of the loop circuits shown in Fig. 3, loop circuits inductively coupled with the receiver branch may be used.

The author has discussed in a more comprehensive manner the tuning of conductors containing looped circuits so as to exclude currents of one particular frequency while making the conductor selectively responsive to currents of another particular frequency in a paper read before the electrical section of the Canadian Society of Civil Engineers, March 9, 1905.[14]

The arrangement of receiving apparatus shown in Fig. 4 shunts the currents from the neighboring transmitters out of the receiver by means of branch circuits separately made resonant, one to each of the frequencies generated at adjacent or nearby stations.[15]

The arrangement of Fig. 5 is typical of the induction balance circuit which can be used to render a receiver irresponsive to the currents generated by the transmitter at the same station. In this arrangement, the branch *G O* is separately tuned to the transmitter frequency, while the branches *O D*, *P D* and *D G* are separately tuned to the receiver's frequency. The device *A* is one having adjustable resistance, inductance, and capacity, and whose vector impedance may be made to correspond to any scalar multiple of the vector impedance of the line measured from the point *P* outward.

The transmitter and receiver branches *O G* and *P D* respectively are conjugate, the vector product of the vector impedance of the branches *O P* and *D G* being equal to the vector product of the vector impedance of the branch *O D* and that of the line. Bridges of this kind must be balanced both for the resistances and for the reactances of the branches.[16]

It is evident that when the conditions tending to produce interference in a receiver by a neighboring transmitter are exceptionally severe, the methods of freeing the receiver from such interference shown in Figs. 3 and 4 may be combined in the receiver without any difficulty. With a receiver so protected against "cross talk," the amount of energy of the current to be excluded may be millions of times greater than that of the current to be received and differ from the latter in frequency by but a few per cent. without causing the least interference.

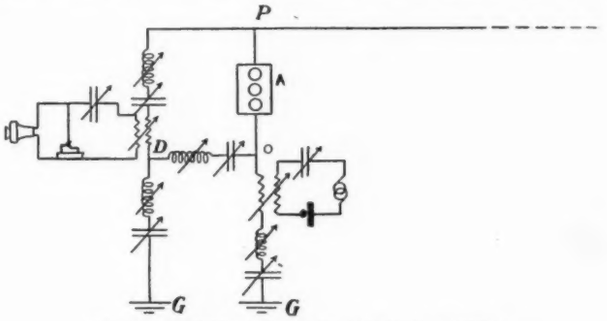


Fig. 5. Typical Induction Balance Circuit.

[14]See also U. S. patents to Stone, Nos. 767,994 and 767,995.
[15]See U. S. patents to Stone, Nos. 884,106, 884,107, 884,108, and 884,109.
[16] See "Electrical Papers" of Oliver Heaviside, vol. ii, pp. 33-38 and 366.

(*To be continued.*)

Practical Telephony for the Practical Exchange Manager

Eighth Installment of a Series of Articles Relating to the Management and Operation of a Moderate Size Exchange—Selection of Construction Gang—Requisites of a Foreman—Record Forms and Their Importance—Some Stock Keeping Records

By H. R. Van Deventer

The telephone business consists of a large mass of detail, every portion of which must receive careful consideration. Purchase as much material as possible in one order so as to receive the very best market prices, and distribute this material intelligently. For instance, suppose 100 miles of line wire is necessary. Often, without thinking, this wire will be ordered out for shipment to some point near the beginning of the line, which, for example, is to be 50 miles long. The result of this lack of forethought is, that a good deal of wire must be again transported many miles before it can be used. A little calculation would have split the wire into three or four shipments and distributed it by rail to points along the line as near as possible. This also applies to all other material.

The best method to pursue in purchasing material is to get nearly all of the poles set and not to order the wire until it is required for use. This eliminates a storage and the necessity of paying for it until the time when it is used. Attention must be given so that it will be ordered for delivery when needed. The time it takes for freight to get from the point from where the wire is shipped to the point of consumption, should be carefully investigated. Where this is from ten days to two weeks, it is well to allow another week's time to be certain of its arrival.

Selection of the Construction Gang.

Now a word as to the selection of the men. The general foreman should be a trained man capable of diplomatically getting a right-of-way, or of soothing out some one who is angry because a pole is to be placed in front of his house, etc., as well as a man who can intelligently lay out the work and then see that it is done.

It is not absolutely essential that this foreman be what is so often termed a "hustler." Often the man who buzzes around and makes the most noise, is really not the one who does the most work. There are a great many big-mouthed foremen who do not plan their work. While they work hard themselves and make their gangs work, they really accomplish little, owing to the lack of headwork in the beginning. The telephone business has been particularly afflicted with this type.

A general foreman should be a man of experience in telephone construction. For rural line work, he should be a man experienced in this particular branch of construction. A foreman of a city construction gang is not

well suited to country work and vice versa, as these are two classes of construction entirely different from each other and requiring different methods of work.

The linemen should be men of intelligence and skill, who are fully equipped with tools. Often when asked, "Have you a complete set of tools?" a lineman will answer, "Yes," if he is of the sort who travel from place to place, a "floater," as he is often termed. Upon examination it will be found his "tools" consist of a screw driver and a pair of pliers and possibly a pair of "hooks." It is often the case, however, that for some good reason, a good man has not a complete set of tools. It pays to have several sets on hand with which to supply the men, if they show that they are competent and willing to work. This is mentioned for the benefit of those in the smaller towns who must rely on the men who come to them.

Electric light linemen, that is those having had experience in this work only, are not particularly desirable for telephone work.

The main requisite in a lineman should be an ability to climb quickly and easily. Some men wear themselves out getting up and down the pole and have no strength left with which to work. It is evident, even to the most casual observer, whether or not a man can climb after seeing him walk up the stick once. Climbing can only be

JOHN SMITH, Pres. WALTER JOHNS, Secy. W. BROWN, Mgr.

Citizens Telephone Co., Inc.

REFERENCES
1st Nat. Bank, Smithville
Dun or Bradstreet

CAPITAL $5,000.00

Smithville, Va.

M (insert here name of firm from whom purchase is made) _____

Route (express or freight) _____

Ship to (insert here name of station to which goods are to go) _____

The following ORDER, which must be acknowledged immediately, stating when shipment will be made.

Here state goods wanted, for instance —

20 Coils #14BB Wire @ 4½c per lb.

5000 #9 Pony Glass Insulators @ $12.00 per M.

Yours truly,
CITIZENS TELEPHONE CO.
Per W. Brown

Put this order No._____ on your invoice. Bill of lading with rate and weights must accompany invoice. We do not pay for boxing or cartage.

Fig. 15. Copy of a Purchase Requisition or Order.

acquired by the help and inspiration of the skilled. Hence men who are willing to teach others should be given the preference.

It is possible for a man to learn to climb by himself, but the "gone" feeling and horror with which the novice surveys the landscape after he has triumphantly reached the top of an 18-foot pole and is alone, is something which is not altogether pleasant. However, if there is a general lineman at the top and the beginner gets up there, he feels as if hope were not entirely lost, and that terrible downward journey does not appear half so perilous.

Some linemen are much adverse to teaching a beginner, as they think it interferes with their prestige for everyone in the gang to know how to climb. On the other hand, there are men who get a good deal of fun out of the beginners and who like to teach them all that they can. It is much better to select the latter type if this point can be ascertained in advance.

The traveling lineman who is often picked up in small towns and in the country, is sometimes looked upon as a very rough fellow, but such is the exception rather than the rule. The life is an open, free one, that is conducive to a flow of spirits and the men at times are inclined to "cut up." They may even drink a little but as a rule the absolutely intemperate can be readily sorted out. This is a matter which need not cause much concern these days. A gang of teetotalers is a rarity. On the other hand the intemperance often found in the past is now entirely gone. One man in a gang habitually addicted to drinking too much, is not only a bad example but an actual hindrance. If such a one is employed, the quicker he is gotten rid of the better, regardless of his ability while sober.

Confidence in the Foreman.

The gang foreman should be a man in whom confidence can be imposed as to the handling of money and stores. It is necessary in a great measure to place considerable reliance in the foreman, as it is almost impossible to devise any voucher system that is absolutely perfect. Too many of the larger companies have methods that attempt to check every penny which passes through the foreman's hands. This is worse than useless in the majority of cases and is simply a needless expense. If a man is dishonest, he is going to beat the company. If he is honest, the various vouchers are of no use except as to auditing. The best way is to place in the foreman's hands a reasonable fund to cover his running expenses for teams, etc. Have him keep a simple expense book, taking receipts where possible for his expenditures. Audit this account in a simple, intelligent manner, thus showing the men that you think them honest as the majority of them, 99 per cent. are.

Do not give the foreman a thousand and one forms of various kinds to fill out. Do not expect him to get three receipts at the hardware store every time he buys a keg of nails; one for your auditing department; one for himself; and one for the general storekeeper for general construction account, as is sometimes done. Do not expect that every time he buys a keg of nails that he will have time to stop his work to make out an order for it with two or three duplicates for various sundry departments in the office. The men themselves realize the uselessness and red tape of such methods and rebel against it. Where they have to do it, it is a source of dissatisfaction. Stop the leaks with men, not with system. Employ persons who can be trusted and rely upon them rather than on "red tape."

Sufficient has been said to indicate some of the qualities necessary in the men. Above all, a good disposition is necessary in every man in the gang, if they are to work together harmoniously. Remember these are the vanguard of the company's army in the invasion for business, they are the first "point of attack." Have them creditable; efficiency and politeness pays.

Suitable record forms, properly kept, are of the greatest service in the management of even the smallest company.

The Order Sheet.

The first form to consider is the order sheet or form upon which the company orders its supplies from the manufacturers. Such a form is shown in Fig. 15, and has a tissue second sheet or duplicate copy. These second sheets constitute the company's record of goods purchased, and should be filed alphabetically, according to firm name, in a suitable binder. As the sheets should be of the ordinary letter size, a regular box file will also answer for the purpose. The order form, Fig. 15, shows all the information the shipper needs. Write plainly, giving a proper description if code number is unknown, and avoid terms like "Same as last," etc.

In the case of new companies having names such as "Home," "Citizens," etc., it is well to print at the head of the order, the names of the responsible men back of the company, and to

REMINDER
of a Ready-to-Ship Stock of J-M FIBRE CONDUIT
"The Strongest Conduit Made"

Shipping J-M Fibre Conduit

Careful machining, insuring perfect joints.

A material that combines lightness in weight, strength, smooth bore, rigid inspection before shipment, tells the story of J-M Fibre Conduit, which is furnished with Bell or Straight Joints, in four styles, viz.:—

	Socket	Drive	Sleeve	Screw
Style "J"	..... 54" lengths		Style "M"	..... 60" lengths

Our nearest Branch will be pleased to supply any additional information

H. W. JOHNS-MANVILLE CO.

MANUFACTURERS OF ASBESTOS AND MAGNESIA PRODUCTS — ASBESTOS — ASBESTOS ROOFINGS, PACKINGS, ELECTRICAL SUPPLIES, ETC.

Albany, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Indianapolis, Kansas City, Los Angeles, Louisville, Milwaukee, Minneapolis, New Orleans, New York, Omaha, Philadelphia, Pittsburgh, San Francisco, Seattle, St. Louis, Syracuse

For Canada: THE CANADIAN H. W. JOHNS-MANVILLE CO., LIMITED.
Toronto, Montreal, Winnipeg, Vancouver

1825

The Arrester that is getting the attention—

WHY?

Because it is killing that expense of making long drives over party lines looking for a partially grounded carbon, the trouble that is so often difficult and expensive to locate. This accounts for this arrester finding its way into almost every rebuilding order. The day of lightning trouble is passing. Write for particulars and prices.

Metallic Lightning Arrester Company

Winona, Minnesota

INSULATE SHELL — ENLIGHTENING THE TELEPHONE TRADE

Unequalled mechanical details, strength and finish are the inherent qualities of all the "INSULATE" products.

The foremost Telephone Manufacturers everywhere use the "INSULATE" products.

Manufacturers of TELEPHONE RECEIVER CASES, MOUTH PIECES, HANDLES, KNOBS, SWITCHBOARD TERMINALS, ELECTRICAL INSULATIONS for all Purposes

"A CELEBRATED CASE"

AGENTS

A. J. COX CO.
28 South Jefferson St., Chicago, Ill.

R. S. MUELLER
423 High Ave. Cleveland, O.

GENERAL INSULATE & MACHINE CO.
1008 ATLANTIC AVE.
BROOKLYN, N.Y. U.S.A.

Gentlemen:
Please send us samples and quotations on following "INSULATE" goods.....
.....
Name .....
Address .....

Please tell the Advertiser you saw his Announcement in TELEPHONY.

Carrying 30 feet 3-inch socket joint conduit.

Orangeburg Fibre Conduit

("Admitted to be the best Fibre Conduit")

Made in FOUR STYLES OF JOINTS

Socket, Sleeve, Screw and Harrington

WITH BENDS AND FITTINGS FOR SAME

Is the lightest conduit made

and means low freight and cartage costs

Send for The Conduit Book

THE FIBRE CONDUIT COMPANY

103 Park Ave., New York
1741 Monadnock Bldg., Chicago
S. B. Condit, Jr., & Co., Boston, Mass.
Bryant Zinc Co., Chicago, Ill.

MAIN OFFICE AND FACTORY
Orangeburg, New York
McClary-Jemison Machinery Co., Birmingham, Ala.
Tri-Provincial Electrical Supply Co., Winnepeg, Can.

Pierson, Roeding & Co.,
San Francisco, Cal.
Los Angeles, Cal.
Seattle, Wash.
Salt Lake City, Utah.

Underground
CONDUIT SYSTEMS
our specialty
Work started at any point within 48 hours
Write us for estimate

G. M. GEST
ENGINEER—CONTRACTOR

Cincinnati
Chicago

Executive Office
277 BROADWAY NEW YORK

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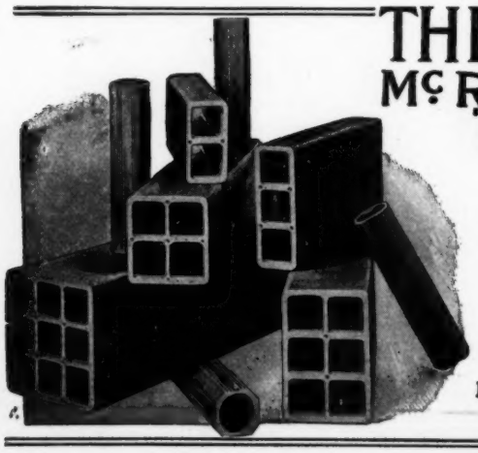
Montreal



THE STANDARD FOR QUALITY
McROY — CONDUITS — CAMP
The Pioneer Manufacturers

Specify either of the above standard makes when writing your underground specifications.

Factories East and West, enable us to figure reduced freight rates, assuring you of the lowest delivered prices without sacrificing quality in any way.

Large stocks of both single and multiple duct constantly carried, thus insuring an early delivery.

Our conduits have been used for twenty-three years. Inquire about us in any city where conduits have been installed.

McROY CLAY WORKS
The Rookery, Chicago

H. B. CAMP COMPANY
New York Pittsburgh Chicago

Please tell the Advertiser you saw his Announcement in TELEPHONY.

give some bank or other reference. A name such as "Home" means nothing to a supply dealer a few hundred miles away. Much delay and correspondence will be obviated by giving, on the order blank, such information as will enable the shipper to investigate the financial standing of the company easily and quickly.

Where the company is not incorporated, let the treasurer be a merchant or other person having a rating with Dun or Brad-

This check is in settlement of .....
.....
.....
The indorsement hereon is the *only receipt desired.*
Do not send separate receipt.
.....

Fig. 16. Voucher for Back of Check.

street and let him order and guarantee payment for all purchases.

It is poor policy to always buy of the lowest bidder, especially in the matter of supplies. Standard materials are practically the same price all over the country. The main question is the difference in freight. Therefore the supply business naturally should go to the jobber nearest home, even if some one a little farther away should bid lower. Avoid getting lump bids. Ask for, and only consider, bids where the unit price of each article is extended. Deal only with reputable, well established houses.

Stock Keeping Methods.

When the goods arrive, they should be carefully unpacked, and checked by the packing slip and carbon copy of the original order. Switchboards are now usually packed in crates by the manufacturers, so they can be examined for cracks due to rough handling without removing them from the railroad company's premises. This examination should always be made, and damage will usually show itself by the corners of the panels starting or the bruised condition of the crate itself.

After the material has been carefully checked by the party receiving it, the invoice should be examined to see that the prices at which the goods are billed correspond with the quotations and that all extensions and footings are correct. Usually this second checking, in small companies, is made by the manager, who also pays the bills. If the invoice checks O. K., it is attached to the carbon copy of the original order, and filed away. Before this is done, however, a numbered check is

STOCK CARD
MINIMUM 500

	IN		OUT
10/2	5000	10/3	500
10/4	5000	10/6	1500
		10/7	2500

Fig. 17. A Simple Form of Stock Card.

made out for the amount of the invoice, and the date and number of the check noted on the invoice. This check not only pays for the goods, but may be made to serve as a receipt for the transaction by printing on its back a form similar to that shown in Fig. 16. Hence the manager need only to keep the cancelled checks in order to have a set of receipts for all his purchases, thereby making one piece of paper do the work of two.

Another good thing is to note on every invoice the amount of freight, express and dray charges, so that this amount can be figured in as part of the cost of the goods, to which it properly belongs. This will, in time, enable the manager to gather a lot of valuable data, as to the weights of materials and the freight rates to various places in the territory. A note may also be made of the length of time a shipment is on the road. If kept up, this record on the carbon copy of the original order will be a comprehensive record of everything connected with the purchase, cost, weight, transportation charges, delivery time, drayage charges, etc., of the goods.

As soon as the goods are inspected and counted, they should be placed in the stock, or storeroom. Often the same man takes them out who puts them in, but in any event, a record should be made. Usually insulators, brackets, pins, knobs, etc., are kept in bins arranged along the sides of the room with shelving above them. A card may be prepared for each bin, known as the "Stock Card," Fig. 17. Any stock put in the bin is added to the amount shown in the "in" column and when taken out, to that in the "out" column. By subtracting one from the other, the amount in stock is instantly and easily obtained.

It is necessary to decide on a minimum stock in order to prevent running out of any material. As soon as any card shows the minimum amount is reached, an order should be placed. The calculation as to the permissible minimum stock should be carefully made, taking into consideration the length of time necessary to secure the material and the rapidity with which it is ordered into use.

(To be continued.)

An Independent Telephone Town.

In the early days of the Independent telephone movement, about 1897, two brothers by the name of Groat built a telephone exchange in Phelps, N. Y. They had a few single wires running from house to house, all centering in a "switch" at their store. Any one who wanted service could buy a telephone and connect on. They had about 30 subscribers, but it was sufficient and answered the requirements, as it was merely a neighborhood affair.

In 1901 the Inter-Ocean Telephone Co., of Buffalo, built its line through Phelps and connected its toll line to the switch. Phelps then had connections to Newark, Geneva and other points in all directions.

Groat Brothers later retired from business and disposed of their plant to the Inter-Ocean company, which operated the plant as a toll station exchange for some years.

In 1909 H. F. Flint, co-operating with the Inter-Ocean company, organized the Phelps Home Telephone Co., he having a minority stock interest, while the majority was lodged with one other person. His plant was a success from the start. Its list rapidly increased to about 328 subscribers in June 1912, while his competitor's list had dwindled to about 75.

About June, 1912, Mr. Flint's associate disposed of his interest in the Phelps company to the Friendship Telephone Co., a Bell organization. In August, 1912 Mr. Flint organized the Phelps Mutual Telephone Co., having among its stockholders many of the prominent business men of the village. It was incorporated and immediately commenced building a new plant. Of the 328 subscribers which are connected to the old company, 325 have now signed contracts for service with the new Phelps Mutual.

There is apparently no particular struggle for supremacy between the competing telephone companies in Phelps, says Telephony's correspondent. The public simply wants Independent service and is going to have it. During the time the Phelps Home company was operated by Mr. Flint, it learned about good service and appreciated it, and is supporting the new company in the loyal way in which it supported the old one.

REPORT ON CHICAGO BELL COMPANY.

(*Continued from page 730.*)

ployes had increased 23.8 per cent., the monthly payroll had increased 44.5 per cent.

Of more interest, perhaps, are the figures for the traffic department, containing the operators who handle all the messages. These increased from 4,090 in 1907, with an average monthly wage of $31.17, to 5,116 in 1911, with an average monthly wage of $35.23. The average pay per employe increased 13 per cent.

The pay for an eight hour day for an ordinary operator doing no Sunday or holiday work rises from $23.84 a month during the first six months of employment to $39 the last half of the third year, and by successive steps to $49.86 the tenth year. Higher wages are given to supervisors, whose pay gradually increases to $56.36 a month in the seventh year.

Plans are now being considered for a pension scheme in all the Bell companies, which will add somewhat to the expenses of the company. Further increase of wages, with increased cost of living and the increase of wages elsewhere, are also likely during the next five years.

Since the company, however, has successfully met previous increases and seems to be doing quite as well by its employes as do other telephone companies, there does not appear to be any reason for giving further consideration to the subject at the present time.

The Chicago Telephone Co. spends more money per telephone than do other large Bell companies in operators' wages, schooling, rest and lunch room expenses. In this respect the cost per telephone in Chicago last year was $1.87 greater than the average of all the Bell companies, and $1.40 greater than in the seaboard states from Maine to Virginia.

To what extent this excess of expenses in the traffic department is due to the large number of nickel telephones and the extent of the flat-rate service, and to what extent it is due to better wages and greater interest in the welfare of the employes, it has been found impossible to determine. Certain it is that the welfare work, such as rest and lunch rooms, schooling, etc., among the employes is carried much farther in Chicago than in most, and probably than in any other places.

The yearly expense here is 73 cents a telephone for these purposes, as compared with 31 cents on the average, for the country as a whole, and 41 cents on the average for New England and the other seaboard states north of the Potomac.

Practically all supplies and materials for construction, outside of buildings, are obtained from the Western Electric Co. Since the majority of its stock is owned by the A. T. & T. Co., which also owns over 95 per cent. of the stock of the Chicago Telephone Co., there is naturally some suspicion of the prices paid by the local company. Investigation elsewhere, as well as studies that it has been possible to make in preparation of this report, have not confirmed these suspicions. At least, so far as the present report is concerned, this particular matter may be omitted from further consideration.

Two other expenses, aside from those of the traffic department, are materially greater in Chicago than elsewhere. One of these is the expense for station removals and changes, and the other is the expense for repairs.

The considerable percentage of the population of Chicago which moves every year, and the extent to which the cheaper type of telephone, the nickel telephone has been extended, are supposed to account for the difference in expenses with regard to station removals, which average over $2 per telephone. The larger cost of repairs in Chicago than elsewhere probably has a tendency to keep down the need for renewals and will be considered further in connection with the subject of depreciation.

Payment to the A. T. & T. Co.

The operating expenses thus far considered were higher, in some respects, than in other companies, but have a sufficient justification to warrant our acceptance of the same in this report.

Very different in character is the yearly payment by the local company, in common with every other Bell company, of 4½ per cent. of its gross receipts from telephones to the A. T. & T. Co., a company, it must be remembered, which, by its ownership of the majority of the stock of these various companies, stands at both ends of the bargain. The more, however, that the right hand—the A. T. & T. Co.—decides that its left hand—the Chicago Telephone Co.—shall pay, in the form of a percentage of the gross receipts, the higher must be the charges against the subscriber, to pay this disguised dividend. The payment made by the Chicago Telephone Co. in 1911, of $537,585.12, amounted to $1.69 for each of the 318,135 telephones, often called stations, in use on the average, during the year. It was equivalent to 1.45 per cent. of the average investment of $37,194,587.95. (Hall's Report, pages 4, 36-9.) The payment for the city portion of the business was $445,550.42 and will doubtless be about $500,000 in 1912.

In return for this payment, the Chicago company receives three advantages: First, the rental, with all repairs and renewals, of the electrical portion of the subscribers' equipment, —the transmitter, receiver and induction coil; second, certain patents; and third,. legal, accounting and engineering assistance from time to time. These points will be considered in the above order:

1. *Transmitter, Receiver and Induction Coil.* The Western Electric Co., which makes these instruments, has refused the writer's request for information on their cost, or the cost of maintenance and renewals. The Kellogg Switchboard & Supply Co., of Chicago, claims to sell an equally good set for $2.80, with a reduction of 15 per cent. if bought even in small lots, in connection with the Bell cord, stand and other small parts that go with a desk or wall outfit. If the price, under these circumstances, and with the discount, is only $2.38, it may fairly be presumed that the cost, with a fair profit to the Western Electric, which supplies all these parts for over 4,000,000 telephones, must be below this figure.

For our present purposes, one needs to know not only the cost new, and the fact that about one-fourth of the number are yearly returned by the Chicago Telephone Co. for some repairs, but also the cost of these repairs, and the life of the instruments as a whole. In the refusal of the Western Electric to give this information, we may fall back upon the fact that on September 6, 1907, the Chicago Telephone Co. met the bids of Independent companies for the sale of transmitters, receivers and induction coils, by agreeing to rent the same to the city of Chicago and repair and renew them, for 50 cents apiece per year. The city accepted the offer, and took 1,557 such sets for the police, fire and street departments, at this rate, and would have probably continued to act on this contract had not the ordinance of November 6, 1907, given the city, in return for the franchise, the right to use the transmitter and receiver free of charge. In the absence of any access to the books of the Western Electric Co., it must be assumed that the contract with the city by the Chicago Telephone Co. was not a losing one. It would indeed be fair to assume that if the company could afford to make a 50 cent price in competition with other companies for the small number needed by the city departments, it could afford to make a still lower price to the Chicago Telephone Co. for the vastly larger number needed by the latter.

2. *Patents.* The Chicago Telephone Co. does not appear to buy patents as such, but to buy from the Western Electric Co. goods, many of which are patented. Since most of the goods, however, have been sold of late on substantially the same terms to Independent telephone companies, the question at issue relates only to the few patented articles which the Western Electric Co. refuses to sell to other than the Bell

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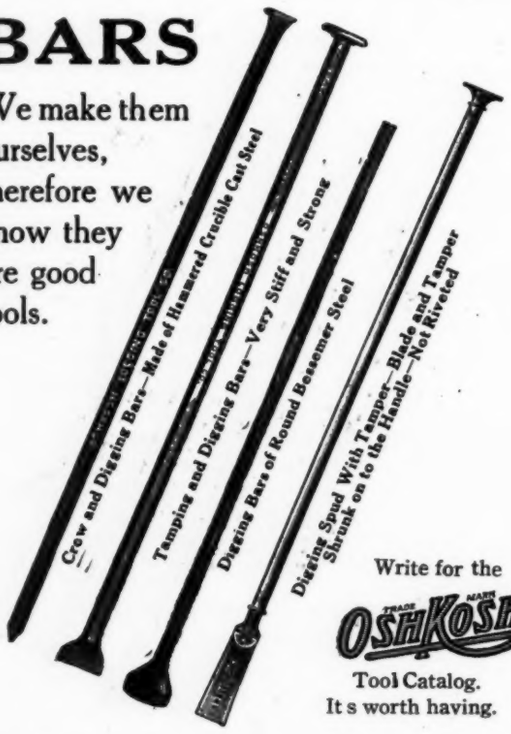
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companies. The only one of these patented articles upon which the Chicago Telephone Co. lays any stress, is the so-called Pupin coil, invented by Prof. Pupin of Columbia University, New York City, about twelve years ago. Its purpose is to reinforce the electric current at various points along the telephone line so that a small wire will carry the sound as distinctly as a larger and therefore more expensive wire

Rental of transmitter, receiver and induction coil	$0.50
Interest, depreciation, taxes, royalties, etc., on patents, estimated at 22 per cent. of the cost—9 cents per telephone —of said patents, as above	.02
Services and unknown or undervalued items, not over	.48
Total reasonable payment.	$1.00
Amount of excess payment per telephone	.76
Amount of excess payment, total	$192,837.00
Per cent. of said excess payment to the present conceded value of all the telephone property in the city, of $25,495,036.	76 per cent.

Table No. 3. Rentals to A. T. & T. Co.

would otherwise do. Its chief use is on long distance lines. In Chicago it is only used on some of the connecting trunk lines from one central office to another when the latter is over nine miles distant. Figures have been presented by the Chicago Telephone Co. to prove that even on these lines the Pupin coils have saved an investment of $2,000,000 worth of copper wire, whose yearly value, on a 7 per cent. basis, with an allowance of 1½ per cent. depreciation, is $170,000 a year.

There is, however, another side to this question. It is not only what these patents may be worth to the local company, but their cost to the parent company. Especially is this important when the parent company absolutely owns and controls the policies of the local company, and all bargains which it may make. Now, the A. T. & T. Co., in its annual reports up to and including those for 1907, gave a yearly statement of the value of all its patents. It is to be regretted that this policy of publicity was not continued. However, since the Pupin coil was patented about 1900, and since no important patents since 1907 have been emphasized as defenses for the payments by the local companies, the balance sheet of the A. T. & T. Co. for January 1, 1908, may be quoted as very significant. According to that report the entire value of all the patents owned by the A. T. & T. at the close of 1907, was given to the stockholders as only $277,937.35. Since the total number of telephones belonging to the Bell companies in the United States at that time was 3,035,533, the value of these patents per telephone was only 9 cents, and the entire capital value to be apportioned to Chicago, on the basis of the 202,600 stations then in service by the local company, was less than $20,000. To be sure, the smaller companies have less use for the Pupin coil than has Chicago, but by far the greatest use is on the long distance lines.

3. *Engineering, Accounting and Legal Services.* The company undoubtedly receives some benefit from the parent company in these ways. Whether the latter does not receive a sufficient reward in the dividends on the majority of the stock owned by it, in every local company, is another question.

As regards all three of the above lines of service from the national company, it may be said that the reports of this company to the Massachusetts Highway Commission, indicate a very large profit from the aid given in the above ways to the local companies.

The 4½ per cent. payment to the A. T. & T. yielded in 1911 for business within the city $445,550. This was $1.76 for each of the 253,753 telephones in use on the average last year. Of this $1.76 per telephone, the amount justly earned by the A. T. & T. does not appear to be over $1 made up as given in Table No. 3.

There may be a legal question as to the power of the city to reduce this payment directly, but that these considerations should have some bearing on the fixing of rates, which in the end inure to the benefit of the A. T. & T. now owner of over 95 per cent. of the stock, is clear.

Maintenance and Depreciation Reserve.

The final element in operating expenses centers around the effort to keep the original value of the property intact.

Before we can consider a fair return on the cash put into a property by the stockholders and bondholders, we must assume that the principal of the investment has not depreciated in value. Otherwise the investor will have the right to demand in his turn not only a fair profit, but insurance against loss of the original investment.

Now a telephone company, like other municipal utilities, has to face a tendency to the decline in value of its property from four causes, viz., physical decay, inadequacy, obsolescence, and municipal requirements.

1. Physical decay or wear and tear: All material things wear out in time, or are liable to destruction by accident. Repairs must be constantly made, and in time the plant must be renewed or replaced.

2. Inadequacy: The development of the business of a telephone plant often requires the substitution of larger switchboards, underground cables with more wires, etc.

3. Obsolescence: Invention frequently leads to the substitution of new plant for old. For example, we no longer are content with the ringing of a bell in order to secure the attention of "Central," but seek immediate attention by the mere removal of the receiver from the hook. New types of cable and duct are introduced from time to time.

4. Municipal requirements: Cities more and more require the burial of wires in expensive conduits, and sometimes require the re-location of the conduits themselves to make room for subways, etc.

All four forms of decline in value have been encountered

Year.	Average Depreciable Investment.	Maintenance and Reconstruction.	Percentage of Maintenance and Reconstruction to average investment.
1891	$ 1,901,859.40	$ 200,304.50	10.53%
1892	2,580,278.78	255,014.45	9.88
1893	3,322,833.13	276,627.40	8.33
1894	3,730,321.71	352,082.68	9.44
1895	4,010,432.25	435,669.12	10.86
1896	4,363,523.12	413,886.99	9.49
1897	4,703,850.31	355,453.96	7.55
1898	5,177,723.69	452,645.93	8.74
1899	6,171,416.78	515,218.40	8.35
1900	7,651,999.46	883,761.27	11.55
1901	9,560,846.96	816,851.97	8.54
1902	11,981,429.11	1,025,846.49	8.56
1903	14,312,487.60	1,272,578.20	8.89
1904	15,909,051.27	1,102,970.74	6.93
1905	17,304,637.09	1,560,822.09	9.01
1906	19,785,525.00	1,435,440.69	7.26
1907	23,549,541.08	2,311,304.05	9.81
1908	26,293,430.46	2,271,707.11	8.64
1909	27,754,261.76	2,336,507.47	8.42
1910	29,854,483.44	2,323,353.78	7.78
1911	33,277,902.01	2,313,597.12	6.95
1912*	37,350,508.47	2,759,830.68	7.39

*Based on the first six months—January 1—June 30, which showed a net increase of construction of $1,925,052.31, which should be added to the depreciable property December 3, 1911, of $35,425,456.16. The current repairs of $1,401,933.94 less $365,053.60 station removals, leaves $1,036,880.34. To this should be added replacements of $343,035, or a total for the half year of $1,379,915. This is at the rate of $2,759,830.68 for the year.

Table No. 4. Average Investment in Depreciable Property and Actual Expenditures for Its Maintenance and Renewal, 1891-1911.

here. Three lines of expense have been incurred to meet them, namely, repairs, reconstruction and depreciation reserves. The first two, repairs and reconstruction, or renewals, are often classed together under the name of maintenance. They alone represent actual expenditures, directly designed to keep the plant intact. The Chicago Telephone Co., however, has accumulated a reserve to meet extraordinary requirements and such depreciation from inadequacy and obsolescence

as in a rapidly growing plant might not be fully met from the maintenance account.

Postponing for the moment any other method of meeting depreciation, attention should be called first to the amount the company has actually expended for repairs and reconstruction, during the last 20 years.

Until 1904 the company carried all its expenditures to meet these various forms of depreciation in one account, known as the maintenance account. In 1904 two divisions were made,—that of "repairs," and that of "reconstruction and renewal." In January, 1910, a third division was created, known as "station removals and changes." This account had previously been carried in the maintenance account. The present system of accounts is much better. A large part of the expense of change and removal of the telephone transmitter, receiver and house wiring is not an expense of repair or renewal, but a mere removal, or change of location. The estimate of the accountants (Hall's Report, pages 23-24) relative to the amount of repairs and reconstruction follows in Table No. 4.

It gives the average investment, except land, working capital, furniture, fixtures, tools, vehicles and construction in process, as found by Hall, and the actual expenditures for repairs and renewals since 1890. The average investment is found by adding to the investment of January 1st of each year, half of the additions of the year.

(To be continued.)

Practical Subjects—Letters and Discussions

Letters From a Retired Lineman to His Nephew.

Podunk Valley Farm.

My Dear Nephew:—

Yours in reply to my last came yesterday. They certainly are pushing you along. I conclude it is due to one of two things; you are either exceptionally bright, or else they want to get you to break your neck as soon as possible. To put a man climbing in the old days with only a month's experience on the ground would have been considered crazy. Take my advice and go almighty careful. The most dangerous time for you will be when you think you have mastered the art. Then's when you are liable to get a bump or two. But then you've got to have a bump or two before you will begin to climb by instinct.

There are two rules you ought to follow. One is to know that your spur straps are absolutely safe. If you can find any sign of weakness in one, throw it away. The other rule is to make a regular practice of using a safety strap. Young fellows are apt to overlook this. See that your safety and belt are in good condition.

There are a lot of bumps coming to you from the school of experience and all I or any one else can say won't help you much. You probably will not remember to test a cross arm before putting your weight on it, until one breaks with you. After that you will remember without thinking.

Of course you'll have to stand your share of the jokes. If I had been there, I wouldn't have told you to throw your spurs down so the foreman could come up the pole and see what kind of work you were doing. I saw that joke played on Dick Turner, the "goat" in our gang. He dropped his spurs down from a sixty footer one day to the foreman. Of course the foreman carried them over and threw them into the wagon. Dick stayed on the cross arm all the afternoon, but he had to come down. It was a nice smooth pole and sixty feet is a long ways to slide.

If I had been the foreman in your case, I should have made sure to have gotten hold of your hand line also. Forgetting to take that away from you, turned the laugh on him.

But laying jokes aside, I'm going to tell you a few things that may be useful to you. When on the poles keep your coat belted tightly and don't try to work in a long coat. It not only interferes with your work, but is liable to cause you to fall by catching upon a wire or pin just at the wrong time.

You want to learn that certain tools are designed for a certain kind of work and use them for the purpose for which they are made. Connectors were not designed for driving nails, nor a monkey wrench for driving bolts and lag screws. Even if the tools you use do belong to the company, you have no license to abuse them. Another thing to remember when you are on a pole, is to be careful about dropping tools and material on the men below. A man is liable to complain if a hand axe or wrench comes sailing down upon him. Things are quite liable to fall if carried in a coat pocket or laid upon a cross-arm. A belt fitter with loops affords the most convenient and safe means for carrying tools.

When I see a lineman go up a pole with his tools stowed in his overcoat pockets, I am reminded of two fellows I used to know back in Pennsylvania. They were two brothers and neither of them possessed any more knowledge than a six year old boy is entitled to. They were considered as being half-witted and engaged in the well digging business. One day Bill was at the bottom of a twenty foot hole and Joe was up above, working the windlass and emptying the buckets. Bill called up to Joe to send him down the ax. Joe got the ax and stepping close to the edge of the well called out, "Dodge Bill," and dropped the ax into the well. There isn't very much room to play hide and seek in a four foot space at the bottom of a 20 foot hole. Bill wasn't successful in dodging at any rate, for he got a long gash in his shoulder and his nose was broken. Its about the same way with the fellow down below, filling in around a pole. He hasn't much chance to dodge.

I've put off the most important part of my reply until the last. I am not surprised that you are out of money. I expected you would find trouble in making one pay day reach over till the next. I am sending you the ten dollars you ask for, but it is with the understanding that next month you will return twenty to me. I don't want any interest, but I can invest your ten for you in a calf or a pig and make it pay you some thing. If you don't have it, you won't spend it. I'll lend you money any time on those terms; that is that you will send me an equal amount to keep for you. There may be a long dry spell in front of you somewhere and in that way you can have enough veal and pork and mutton to carry you through. There isn't one lineman in twenty who ever saves anything working in a gang and I reckon you're one of the nineteen, from the way you're starting out.

Maybe you'd rather have a few chickens. I put $30 into chickens last spring a year ago, and as near as we can figure out the investment has netted us something like one hundred and fifty.

Bud Marks has just come in an' wants to trade horses so I'll close for this time.

Julia and the kids went over to mother's yesterday, so I'm baching it for a day or two.

Your Uncle Dick.

A Troublesome Case.

About the funniest case of trouble that I can remember happened some time ago in a shoe factory. Before it was finally run down and disposed of it threatened to destroy the peace of mind of at least five persons, namely, the wire chief, the chief operator and the inspector on the tele-

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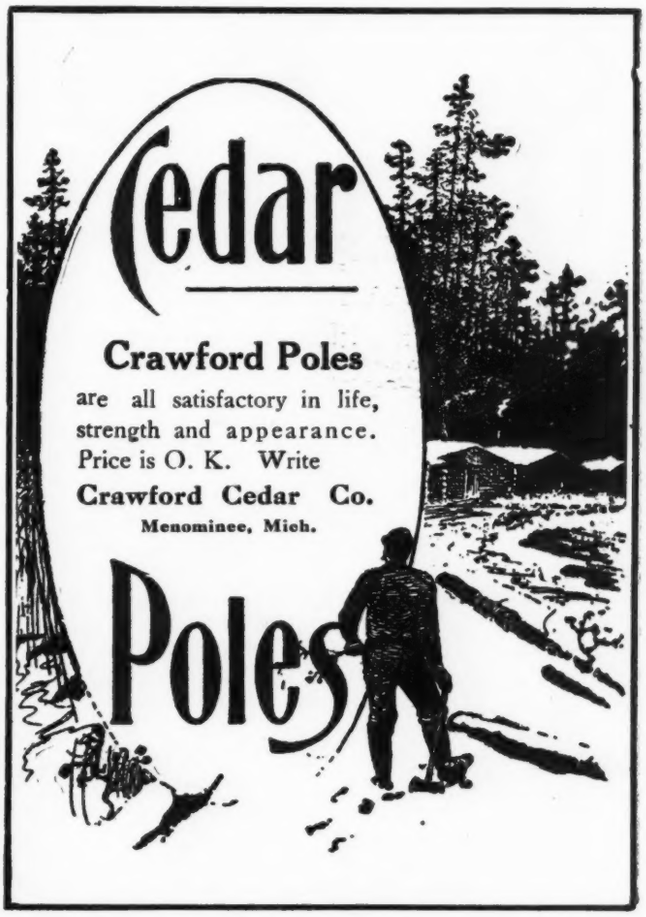

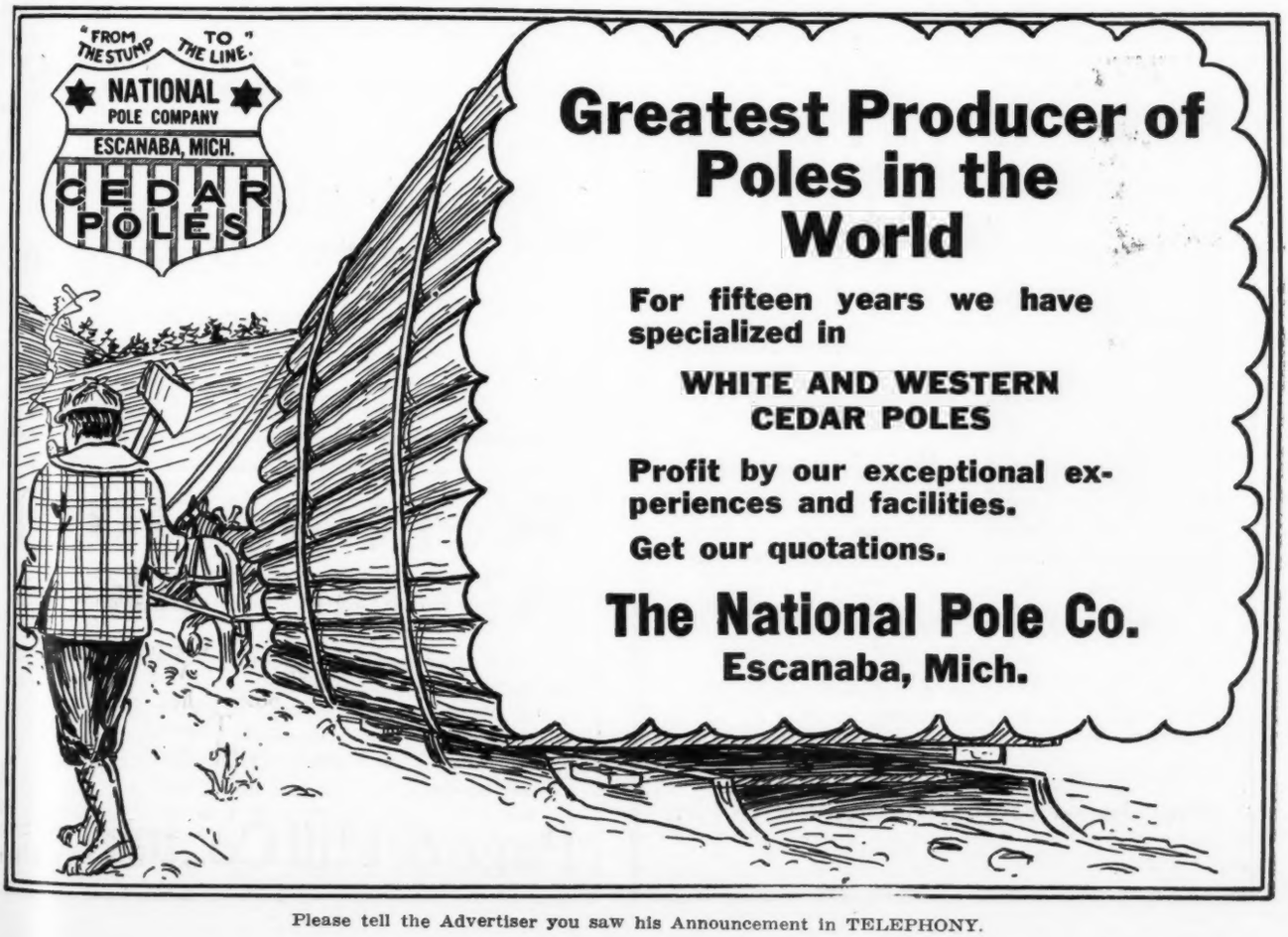

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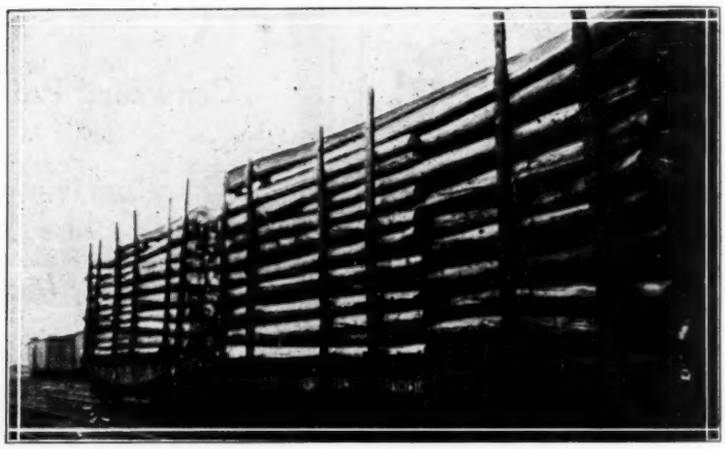

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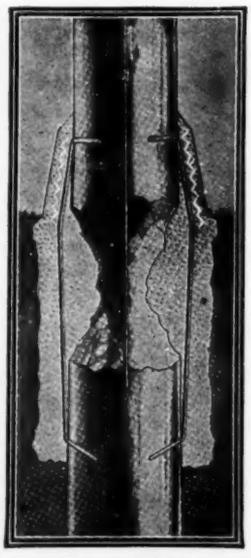

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phone instruments, the office man and the night watchman on the factory end. It happened like this:

Every night just about quitting time, the wire chief would receive a complaint of a permanent signal on one of the lines. On testing for the trouble, the line was found quiet and short circuited, which gave him the impression that the receiver had been left off the hook. Business having closed for the day, the complaint was left for the next morning, when the line was found to be clear. This convinced him that his impression of the night before was correct. The party was called to the telephone and told to kindly see that his receiver was on the hook before leaving at night. He denied having left it off, but said he would speak to the watchman about it and see that it did not happen again. The line continued in service all day long. That evening about the same time as the evening before, another complaint was received similar to the first one, and it indicated the same kind of trouble. This got the wire chief growling worse than ever and what he thought of people careless enough to leave the receiver off the hook is hardly fit to print. This got to be a regular thing for about four days and commenced to get on our nerves, for just as soon as opening hours were at hand the telephone would come to life.

Of course, there is an end even to telephone troubles and the end came about in this way. In distraction the wire chief sent an inspector out early in the morning, before anyone had arrived, so as to catch the receiver down and confront the culprit with the goods. But what he did find was the receiver hook held down securely by a rope thrown over it and fastened to the floor, a precaution taken by the watchman. Further inspection led him to the place where the lines came in through the window. Up to this point he had discovered nothing wrong, but wanting to be thorough he opened up the iron shutters to trace the lines further and right there found his trouble. The installer had made no provision for clearance between these shutters when closed and the line wire. After a while the shutters had worn through the insulation and formed a short circuit. Since the closing and opening of the shutters occurred at the closing and opening of business, the wire chief's deductions, though wrong, were the only ones he could offer. Well, we ploughed a furrow in that brick wall and laid on plenty of tape of both kinds so that it would stay fixed, and everybody was happy, even the night watchman who tied down the receiver with a rope fastened to a screw eye in the floor. A. G. Sandrock.

What Induced the Pupin Loading Coil.

In a recent address before the American Institute of Electrical Engineers, Michael I. Pupin told of the debt the world owes to Joseph Henry, the discoverer of electromagnetic induction, says a writer in the Electrical Record. 'Twas the experiment demonstrating the presence and effect of electromagnetic induction that caused Pupin himself to drop the classics and take up the study of physics. Here is the story in Pupin's own words:

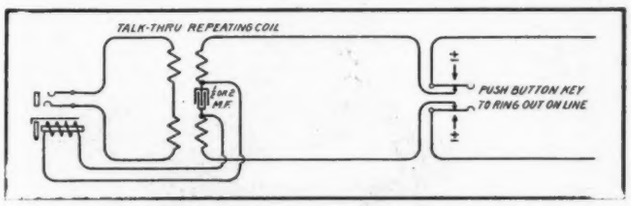
"It is thirty years to a day since I first saw Henry's discovery. I was a student at Columbia at that time, very fond of Greek and Latin, in fact so fond of it that I devoted most of my time to the study of Greek and Latin and classical literature. At the same time I was fond of mathematics and of physics, and of chemistry, and there was a doubt in my mind whether, when I graduated, I should take up as my life work classic studies or physics.

"One day I saw an experiment in the lecture room performed by the late Professor Rood of Columbia. He had a coil of wire, the terminals of which were connected to a galvanoscope, which was attached to the side of the wall so that the class could see the movement of the magnetic needle. The coil was in his left hand, and he had a magnet in his right hand. He moved the magnet a little bit, and off went the needle to one side, and then he moved the coil back, and the needle moved in the opposite direction. They said that magnetic needle moved because it was acted upon by the passage of electricity through the coil. Be that as it may, that needle, I am sure, was never as much thrilled as I was thrilled with that experiment, and I said 'good-by Latin, good-by Greek, I am going to study physics.'"

As every one knows, one of the results of this change of study is the Pupin loading coil, which has made long distance telephony possible. For his loading coil patents, Pupin is said to have received more than a quarter of a million dollars.

Connecting Grounded Lines to Metallic.

Several grounded rural lines come into our exchange, where the local circuits are all metallic. To switch a grounded line to a long metallic line causes an increase in noise and cross talk. I have used repeating coils in the cord cir-



Repeating Coil Circuit for Connecting Grounded to Metallic Lines.

cuits and find that if all of the cord circuits are not fitted with repeating coils, the operators will invariably connect a grounded line with a metallic line through the cords which do not have repeating coils in them. To eliminate this difficulty, I have used long, short, large and small plugs on the cords. With the use of different size plugs, at times some of the cord circuits are tied up and when an operator is busy, it slows the service for her to pick here and there for a pair of plugs for certain jacks.

I have also tried putting a repeating coil in line circuit direct, but that cuts down the ringing current. On heavily loaded country lines all the current possible is needed as most rural lines have not the best of insulation on account of broken insulators and limbs of trees rubbing wires. A great amount of ringing current is shunted from these causes.

In the following circuit I used a talk through repeating coil with a 2 mf. condenser, 200-ohm drop coil and a push button ringing key.

The drop can be wound from 100 ohms up, but I generally use a 200-ohm coil so as to have it sensitive. The condenser may be from ½ to 2 mf. capacity. I use a 2 mf. condenser. Any kind of a key that has make and break contacts will be satisfactory. I find a push button key the most convenient. On this circuit there is also a positive clearing out on both lines.

Louisiana. E. D. S.

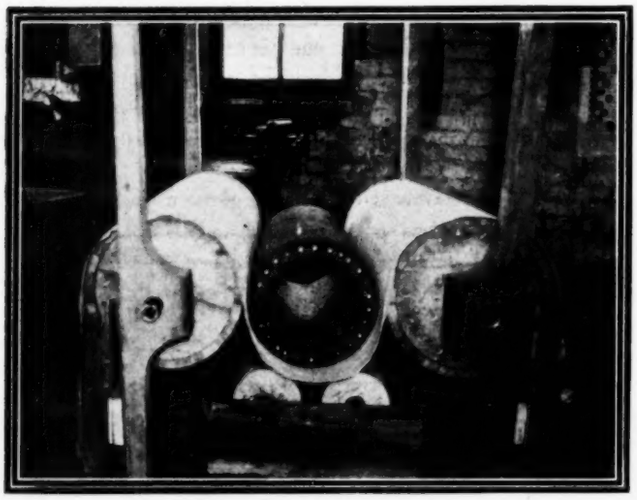
A Kink in Switchboard Cord Maintenance.

The life of switchboard cords can be prolonged 50 per cent. by placing a bumper pad in the bottom of the board, says a contributor to the bulletin of the Federal Telephone & Telegraph Co. The bumper pads are made of extra heavy canvas, tightly woven, of a size to cover the space over which the cord weights hang. The bag is filled with sand, making a pad from 1½ to 2 inches thick. It is placed in such a position so that when the weights fall they will strike the pad and, when resting on it, will be inclined at an angle of 30 degrees to 40 degrees. This takes away all jar and jerk from the cords when the operator releases the plug and, at the same time, does away with considerable noise attendant with the operation.

From Factory and Salesroom

Hollow Reinforced Concrete Poles.

A process for manufacturing hollow reinforced concrete poles has been developed and patented by R. M. Jones, which is apparently along a new line and different from the methods so far in use. The poles are formed by rolling in a belt and no exterior forms are used. The rolling process in com-



The Compression Rolls Type Machine with Pole Butt in It.

pression is said to cause better tamping effects than can be accomplished in any other manner. The concrete mixture is made quite dry, but the compression is such as to bring the water to the surface.

A Joint Complete except for Filling with Concrete.

The mandrel, which is covered with sheet steel, made in two parts, remains in the pole until the concrete sets, when it and the sheet steel covering which form the core are removed. The ratio of taper adopted is one inch in diameter for each 6 feet in length. The concrete wall is 1.5 inch thick, and its application to a 36-ft. pole results in a product with an outside diameter of 12 inches and an inside diameter of 9 inches at the butt and an outside diameter of 6 inches and an inside diameter of 3 inches at the top.

The reinforcement, which is centrally located in the concrete wall, is composed of five sizes of square-twist steel reinforced bars, ranging from ¼ inch to ½ inch, woven with steel wire warp at 6 inch intervals. The reinforcement consists of 10 bars of any selected size the entire length, 18 bars two-thirds of the length and 26 bars one-third the length of the poles. This is woven on a tapered mandrel in a specially prepared loom, which is afterward placed upon the mandrel, and the warp which forms the circumferential reinforcement is united by twisting one around the other. The warp may be varied in size from No. 6 to No. 10 steel wire, as required for producing desired strengths. The woven reinforcement is held centrally between the inner core and the outer circle by pole step sockets woven between two bars of the reinforcement. Distance pieces are also provided for centralizing the reinforcement at other positions around the pole.

The process of forming poles by rolling them in a belt

Hollow Reinforced Concrete Poles.

and passing them between compressor rolls is claimed to produce stronger, straighter, smoother and less expensive poles than any other process.

Drop forge pole steps are supplied to the workmen of the line gangs. They are fitted into the sockets embedded into the concrete wall of the poles and are removed by the lineman as he descends the pole after completing his work.

The poles and fittings may be produced in any color desired, such as white, black or gray. Provision is made for attaching wood or metal cross arms and other fittings to the poles in a more substantial manner it is claimed than is done on wooden poles.

This system of making reinforced concrete poles is marketed as a whole by R. M. Jones & Co., of Denver, Colo. It is said to manufacture the poles in whatever form the user may desire, both as to length and diameter at top and bottom, and thickness of the concrete wall. They are hollow and as light as consistent, facilitating transportation and erection.

W. W. Dean Forms New Company.

The Dean Auto Devices Co., with offices in Chicago, has been organized by W. W. Dean and associates. It will confine its activities primarily to the manufacture of automobile devices and accessories. The officers of the

WHITE CEDAR POLES
Save Jobber's Commission
by purchasing your poles from us.
We are producers.
Our poles are Stocky, Strong and Durable
Get Prices on a Carload.
KAYE & CARTER
1043 LUMBER EXCHANGE-MINNEAPOLIS.

Warehouse: Brookport Ill. LONG LEAF Mills: Corinth and Ripley, Miss.
YELLOW PINE CROSS ARMS
Ship in any Quantity. Standard and Special Sizes.
SOUTHERN PINE MFG. CO., PADUCAH, KY.

We Produce Our POLES From Our Own Stumpage
WASHINGTON IN IDAHO MONTANA
We Can Ship to You at Any Point
Let Us Quote You — We Have All Sizes — Any Amount
EASTERN SALES OFFICE
954 Security Bank Bldg.
MINNEAPOLIS, MINN.
TRI-STATE CEDAR COMPANY
COEUR-D'ALENE, IDAHO

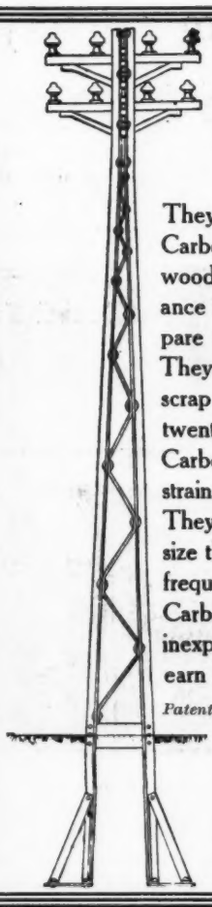
WRITE US—WE MAKE LOW PRICES—SHIP GOOD STOCK
Idaho Red Cedar Poles
30 CEDAR YARDS IN IDAHO, WASH. AND B.C.
WESTERN LUMBER & POLE CO.
Main Office: "Electric" Bldg., Denver, Colo.

We Want Your Pole Orders
QUALITY? Idaho, Michigan and Canadian Cedar. The Best that grow.
PRICES? Remarkably reasonable!
SERVICE? Immediate shipments—any quantity! Poles in *stock* We produce our own.
No matter where you are, our yard locations and shipping facilities make it possible to reach you in a hurry.
THE F. BISSELL COMPANY, Toledo, Ohio.

White Cedar Poles
C. H. WORCESTER CO.
CHICAGO

STERLING QUALITY
Oldest Cedar Pole Firm in Business
MICHIGAN WHITE CEDAR
W. C. STERLING & SON COMPANY
1880 MONROE, MICHIGAN 1912

CEDAR POLES
AND CROSS ARMS
LOWEST PRICES—PROMPT SHIPMENTS
Wm. Mueller & Co., 920 Postal Telegraph Bldg.
Established 1862. - - - - CHICAGO



Before you buy another pole—learn about
CARBO STEEL POLES

They are easily best for telephone use. Carbo Steel Poles are cheaper than wooden poles in first cost, their maintenance is about one per cent a year. Compare that with wood at 7½ per cent. They last fifty years and still have a good scrap value; treated wood lasts but twenty years.
Carbo Steel Poles stand the most severe strains of wind, ice and heavy lines. They haven't the excessive weight and size that makes wooden poles subject to frequent failures.
Carbo Steel Poles are strong, light and inexpensive. It is worth a lot to you to earn about them now.

Patented

Carbo Steel Post Co.
Main Office and Factory
Chicago Heights, Ill.
H. P. HILL, 30 Church St., New York City
G. W. COREY, 124 S. Los Angeles St., Los Angeles, Cal.

CEDAR POLES
We have a fine lot of poles.
Our poles are strong and tough—the kind you need for long service.
LET US SEND QUOTATIONS TODAY
PERLEY LOWE & COMPANY
1458 McCormick Bldg. :: CHICAGO

N. Y. GROUND CLAMPS
"FIT ANY SIZE PIPE" — 4 TYPES
CAMERON APPLIANCE CO.
56 Waters Ave. Everett, Mass.

To Independent and Bell Companies

IN connection with the information we are now gathering for the forthcoming edition of *Telephony's* Directory of the Telephone Industry, we are compiling certain additional and unusual statistics. To the end that this data may be comprehensive and as complete as possible, we ask every telephone company to mail us a copy of their latest directory. We trust all will respond promptly, and assure each of you that the courtesy will be appreciated. Please address it to

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May we send you details?

Electrical Measuring Instruments

Please tell the Advertiser you saw his Announcement in TELEPHONY.

company are: President, Walter D. Steele; vice-president, Wm. W. Dean; treasurer, Keene H. Addington; secretary, Reuben B. Benjamin. The directorate includes the foregoing and W. Clyde Jones.

The actual manufacturing will be handled by the Benjamin Electric Co., which already has several factories in Chicago, Toronto and London, England.

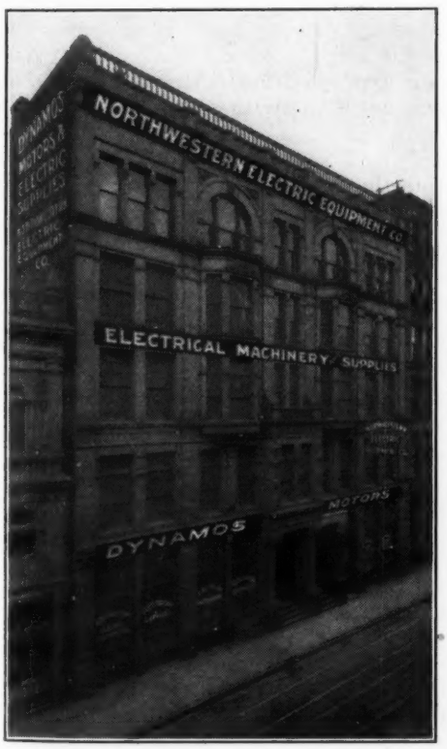
Mr. Dean was formerly president and chief engineer of the Dean Electric Co., of Elyria, Ohio. He will be the engineer for the new concern, ably seconded by Mr. Benjamin, who is a well-known inventor. Mr. Dean, as recently noted in TELEPHONY, has disposed of all his interests in the Dean Electric Co. and, in entering this new field of endeavor, hopes to receive the hearty approval of his numerous friends and associates in the telephone field.

The Northwestern Electric Equipment Company.

The Northwestern Electric Equipment Co., of St. Paul, Minn., is said to be one of the largest jobbers of electrical supplies in the northwest. As it occupies a commodious building at 185-189 E. 4th street, a very complete line of telephone supplies, representative of many makes, is always maintained for the accommodation of its patrons. That it is progressive in every sense is attested by the rapid strides it has made during the past few years. The territory it covers is regarded, agriculturally, as the richest in the country, a claim which crop reports this year seem to prove. And the aggressiveness of its sales force is said have made "N. W. E. E." supplies familiar to every telephone company in the territory in which the company operates.

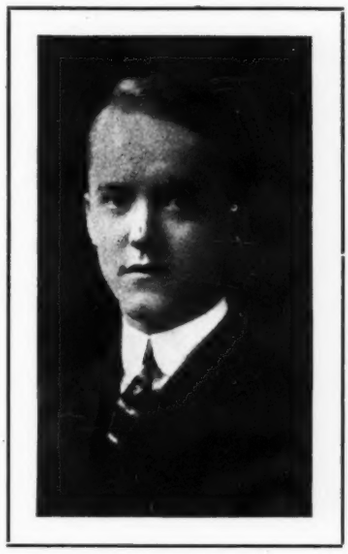
An idea of the extent of the company's operations may be gained from a mention of the following states which are embraced in its field: Michigan, Minnesota, Iowa, North and South Dakota, Montana, Idaho and Washington.

The "Northwestern Buzzer" is the title of the house organ



Home of the Northwestern Electric Equipment Company.

it publishes monthly and which every one of its present, as well as prospective, customers receives. The company endeavors by it to acquaint the trade with its policy, method of doing business, etc., as well as give an adequate idea of the scope and comprehensiveness of its line. It plainly states its platform in the current issue by defining its position as being progressive to the extent of handling all the up-to-date materials demanded by the trade; besides emphasizing "quality" as of more importance than price. Service is another point given considerable prominence.



J. M. Hannaford.

This lively little house organ has increased from eight pages, since March of this year, when the first issue was published, to sixteen pages. It is full of interesting things written in a style easily grasped. J. M. Hannaford, its editor, who has charge of the advertising department, may be properly called a "live wire." This partially explains why the bulletin is so newsy and up to date. It features several departments, among the most important being, "Volts and Amperes", which, as its name might imply, emits sparks serving to keep the company's customers in a pleasant frame of mind. "Konstruction Kinks" is the title of another department, but here topics are handled in a more serious manner. As a consequence it is very informative. It is conducted solely to elucidate such problems as confront the trade in daily experience. The company endeavors in it to also explain the uses and advantages of some of its specialties.

In anticipation that the demand this month for the "Buzzer" might be larger than usual, the company has had a few extra copies printed and will be glad to mail any telephone company a copy.

Paragraphs.

THE ROME WIRE CO., of Rome, N. Y., continues its attractive monthly picture calendar with the November post card, which is fully up to the high standard of previous months. The company carries a full stock of copper wire of all kinds and calls special attention to the prompt service it can give customers.

THE MCROY CLAY WORKS, of Chicago, for its November monthly blotter calendar, has selected the following bit of logic: "The man or the horse who thinks he can win without extending himself, gets the boot when he's nipped at the wire."

W. J. CHAPMAN, of the Minnesota Electric Co., Minneapolis, Minn., reports that the October business was the largest in the history of the company.

THE NAUGLE POLE & TIE CO. of Chicago, has just issued a postcard to the trade. The information contained in it is rather pertinent; immediate action is suggested while freight transportation remains good. It also calls attention to its

well-stocked Chicago yard, wherein are contained all the various sizes of poles necessary for telephone work. This yard is said to have a very large assortment of poles. Any telephone company desiring one of these postcards will be mailed one promptly upon request.

THE AMERICAN CROSS ARM CO., McCormick Building, Chicago, Ill., is distributing a paper weight in the shape of a miniature four-pin cross arm, 10 in. in length and 1 in. by 1¼ in. in section, bearing an artistic name plate which indicates the company's products. Any user of cross arms who desires one of these paper weights may obtain it upon application.

J. M. MOORE, representing the interests of Frank B. Cook, Chicago, in northwestern territory, recently advised a member of TELEPHONY's staff that he was finding conditions very promising for next year. Mr. Moore appeared to be gratified in that he had recently succeeded in closing some very large orders, a strong indication that telephone companies are prospering.

T. J. GULLION, recently appointed traveling representative for northern Illinois and southern Wisconsin for the Cracraft, Leich Electric Co., of Genoa, Ill., has been in the telephone business since 1898. He began as night operator for the old Independent exchange at Lebanon, Ind.

In 1900 he entered the employ of the New Telephone Co., Indianapolis, as collector, remaining with this company for over ten years, having been in charge of their various departments. At the time of his resignation on April 1, 1911, he had charge of the maintenance and equipment of the P. B. X. country exchanges.

In April, 1911, he entered the employ of the Western Electric Co., spending the first three months in the sales engineering department at Hawthorne. Thereafter, and until he entered the employ of the Cracraft, Leich company, he acted as the Western Electric Company's traveling representative in northern Illinois.

Mr. Gullion is an aggressive salesman and knows not only the art of selling, but also the art of being a good fellow.

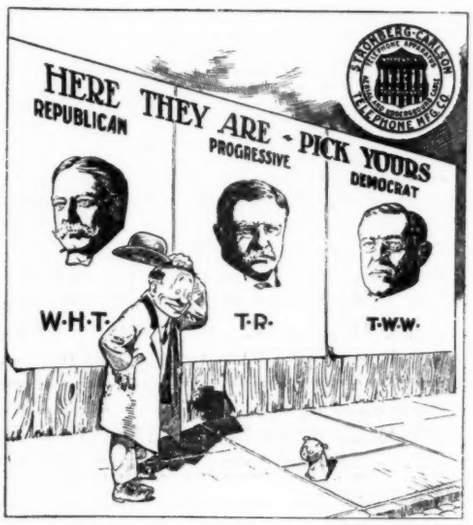
T. J. Gullion.

His varied telephone experience enables him to discuss intelligently the many difficulties which the exchange manager encounters. He is a valuable addition to the company and is well known in the territory in which he is traveling.

THE STANDARD UNDERGROUND CABLE CO., of Canada, Ltd., Hamilton, Ontario, Canada, has issued a booklet entitled "Sterling," which is the company's trade mark for its rubber insulated wire. The booklet tells of Sterling rubber insulated wire and the reason why it is used by many prominent concerns in all parts of the country. Many facts why the company should be able to satisfactorily fill orders in Canada for wire of all kinds. This company is an associate of the Standard Underground Cable Co., of Pittsburgh, Pa., and its product will maintain the high standard of the latter company.

"Phoney Bill" Decides Upon His Vote.

The November blotter calendar of the Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y., shows "Phoney Bill's" stand upon the political question. "Bill" was no longer puz-



"Phoney Bill" and the Ballot.

zled as to his vote in the presidential election. He had decided to vote for "T", having no doubt that "T" would be elected. The illustration which is reproduced from the calendar, shows why "Phoney Bill" was so positive in his declaration as to his vote.

He might have added that others who were in doubt should vote for Quali "T" apparatus, regardless of how the national election went.

Change in the Monarch's District Representative.

The Monarch Telephone Mfg. Co., of Fort Dodge, Ia., announces a change in its representation in parts of the states of Iowa, Illinois, Wisconsin and Minnesota. George O. Wilson, who has been selling Monarch equipment in southern territory for the last four years, has been transferred north and will make his headquarters in Dubuque, Ia. Mr. Wilson will frequently get out in every direction from Dubuque, and will call on all of the Monarch company's customers and others just as soon as he can get over the territory.

Before beginning his work in the sales department of the Monarch company, Mr. Wilson had considerable experience in the operating end of the telephone business, both in the North and South. Besides the benefits derived from his experience in both the operating and selling ends of the business by closely observing the practices of the best and most progressive operating companies in the several states in which he has traveled, Monarch customers and other telephone men in his new territory will find, upon making his acquaintance, that Wilson is the type of man who is wanted to "call again," as he can give something in return for the orders he takes away.

Authorizes Purchase of Small Ohio Plant.

The Ohio Public Service Commission has authorized the Bethel Home Telephone Co. to purchase the plant of the Amelia Independent Telephone Co., and to merge it with its own system. The purchase price is fixed at $400.